**K-6 MATHS : INCORPORATING STAGE STATEMENTS, OBJECTIVES, OUTCOMES & THE LITERACY CONTINUUM**

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| **PRIOR TO SCHOOL** | | |
| **STAGE STATEMENTS** | **EARLY YEARS LEARNING FRAMEWORK** | **THE NUMERACY CONTINUUM** |
| Students bring to school a range of knowledge, skills and understanding developed in home and prior-to-school settings. The movement into Early Stage 1 should be seen as a continuum of learning and planned for appropriately.  The *Early Years Learning Framework for Australia* describes a range of opportunities for students to learn and develop a foundation for future success in learning.  The *Early Years Learning Framework for Australia* has five learning outcomes that reflect contemporary theories and research evidence concerning children’s learning. The outcomes are used to guide planning and to assist all children to make progress.  The outcomes are:  1. Children have a strong sense of identity  2. Children are connected with and contribute to their world  3. Children have a strong sense of wellbeing  4. Children are confident and involved learners  5. Children are effective communicators.  In addition, teachers need to acknowledge the learning that children bring to school, and plan appropriate learning experiences that make connections with existing language and literacy development, including language used at home. | **The Principles**   * Secure, respectful and reciprocal relationships * Partnerships * High expectations and equity * Respect for diversity * Ongoing learning and reflective practice   **The Practices**   * Holistic approaches * Responsiveness to children * Learning through play * Intentional teaching * Learning environments * Cultural competence * Continuity of learning and transitions * Assessing for learning   **The EYLF Learning Outcomes**   * Children have a strong sense of identity * Children are connected with and contribute to their world * Children have a strong sense of wellbeing * Children are confident and involved learners * Children are effective communicators | **ASPECT 1**  **Counting Sequences – Verbal and Written Labels**  **Forward Number Word Sequence**   * Cannot count to 10   **Backward Number Word Sequence**   * Cannot count backwards from 10-1   **Numeral Identification** (the term ‘identify’ refers to stating the name of a displayed numeral)   * May identify some, but not all numerals in the range 1-10   **ASPECT 2**  **Counting as a Problem Solving Process-Early Arithmetic Strategies**  (refers to the range of counting strategies that are used to solve addition and subtraction problems)  **Emergent Counting**   * Cannot count visible items * Does not know the number words or cannot coordinate the number words to count items   **ASPECT 3**  **Pattern and Number Structure**  (The identification of pattern associated with the structure of numbers)  **Emergent**   * Cannot effortlessly and immediately identify small quantities (subitise)   **ASPECT 6**  **Fraction Units**  (Developing a quantitative sense of fractions, relies on forming partitions, relating the part to the whole, and recognising the need for equal wholes)  **Emergent Partitioning**   * Attempts to halve by splitting without attention to equality of parts   **ASPECT 7**  **Unit Structure of Length, Area and Volume**  (Knowledge of the structure of units in length, area and volume)  **Emergent Structure**   * Attempts direct comparison without attending to alignment * May attempt to measure indirectly without attending to gaps of overlaps |

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| **EARLY STAGE ONE** | | |
| **STAGE STATEMENTS** | **SYLLABUS OBJECTIVES & OUTCOMES** | **THE NUMERACY CONTINUUM** |
| By the end of Early Stage 1, students ask questions and use known facts to explore mathematical problems and develop fluency with mathematical ideas. They use everyday language, concrete materials and informal recordings to demonstrate understanding and link mathematical ideas.  Students count to 30 and represent numbers to 20 with objects, pictures, numerals and words. They read and use ordinal numbers to at least ‘tenth’. Students use concrete materials to model addition, subtraction, multiplication and division. They use the language of money and recognise the coins and notes of the Australian monetary system. Students divide objects into two equal parts and describe them as halves. They recognise, describe and continue repeating patterns of objects and drawings.  Students identify length, area, volume, capacity and mass, and compare and arrange objects according to these attributes. They manipulate, sort and represent three-dimensional objects and describe them using everyday language. Students manipulate, sort and describe representations of two-dimensional shapes, identifying circles, squares, triangles and rectangles. They connect events and the days of the week and explain the order and duration of events, telling the time on the hour. Students give and follow simple directions and describe position using appropriate language.  Students answer simple questions to collect information. They use objects to create a data display and interpret data. | **Working Mathematically**  *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* | **ASPECT 1**  **Counting Sequences – Verbal and Written Labels**  **Forward Number Word Sequence**   * Counts to 10 * Cannot say the number word just after a given number word in the range 1-10 * Dropping back to one does not appear at this level   **Forward Number Word Sequence**   * Counts to 10 * Says the number word just after a given number word but drops back to one when doing so   **Forward Number Word Sequence**   * Counts to 10 * Says the number word just after a given number word in the range 1-10 without dropping back   **Forward Number Word Sequence**   * Counts to 30 * Says the number word just after a given number word in the range 1-30 without dropping back   **Backward Number Word Sequence**   * Counts backwards from 10-1 * Cannot say the number word just before a given number word in the range 1-10 * Dropping back to one does not appear at this level   **Backward Number Word Sequence**   * Counts backwards from 10-1 * Says the number word just before a given number word in the range 1-10, but drops back to one when doing so   **Backward Number Word Sequence**   * Counts backwards from 10-1 * Says the number word just before a given number word in the range 1-10 without dropping back   **Backward Number Word Sequence**   * Counts backwards from 30-1 * Says the number word just before a given number word in the range 1-30 without dropping back   **Numeral Identification** (the term ‘identify’ refers to stating the name of a displayed numeral)   * Identifies all numerals in the range 1-10   **Numeral Identification**   * Identifies all numerals in the range 1-30   **ASPECT 2**  **Counting as a Problem Solving Process-Early Arithmetic Strategies**  (refers to the range of counting strategies that are used to solve addition and subtraction problems)  **Perceptual Counting**   * Counts visible items to find the total count * Builds and subtracts numbers by using materials or fingers to represent each number * Objects or fingers remain constantly in view while counting   **ASPECT 3**  **Pattern and Number Structure**  (The identification of pattern associated with the structure of numbers)  **Instant**   * Subitise small numbers   **Repeated**   * Recognises, describes and continues a repeated pattern   **Multiple**   * Creates a pattern of repeated units of a specified size   **ASPECT 5**  **Multiplication and Division**  (Using equal groups in multiplication as well as two different types of division)  **Forming Equal Groups**   * Uses perceptual counting and sharing to form groups of specified sizes * Does not see the groups as composite units and counts each individual item   **Perceptual Multiples**   * Uses groups or multiples in perceptual counting and sharing, eg. Rhythmic or skip counting * Cannot deal with concealed items   **ASPECT 6**  **Fraction Units**  (Developing a quantitative sense of fractions, relies on forming partitions, relating the part to the whole, and recognising the need for equal wholes)  **Halving**   * Forms halves and quarters by repeated halving * Can use distributive dealing to share   **ASPECT 7**  **Unit Structure of Length, Area and Volume**  (Knowledge of the structure of units in length, area and volume)  **Direct Alignment**   * Directly compares the size of two objects (alignment)   **Transitive Comparison**   * Directly compares the size of three or more objects (transitivity) * Uses indirect comparison by coping the size of one of the objects |
| ***Communicating***  **MAe-1WM** describes mathematical situations using everyday language, actions, materials and informal recordings  ***Problem Solving***  **MAe-2WM** uses objects, actions, technology and/or trial and error to explore mathematical problems  ***Reasoning***  **MAe-3WM** uses concrete materials and/or pictorial representations to support conclusions |
| **Number and Algebra**  *develop efficient strategies for numerical calculation, recognise patterns, describe*  *relationships and apply algebraic techniques and generalisation* |
| ***Whole Numbers***  **MAe-4NA** counts to 30, and orders, reads and represents numbers in the range 0 to 20  ***Addition and Subtraction***  **MAe-5NA** combines, separates and compares  collections of objects, describes using everyday  language, and records using informal methods  ***Multiplication and Division***  **MAe-6NA** groups, shares and counts collections of objects, describes using everyday language, and records using informal methods  ***Fractions and Decimals***  **MAe-7NA** describes two equal parts as halves  ***Patterns and Algebra***  **MAe-8NA** recognises, describes and continues  repeating patterns |
| **Measurement and Geometry**  *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***  **MAe-9MG** describes and compares lengths and  distances using everyday language  ***Area***  **MAe-10MG** describes and compares areas using  everyday language  ***Volume and Capacity***  **MAe-11MG** describes and compares the capacities of containers and the volumes of objects or substances using everyday language  ***Mass***  **MAe-12MG** describes and compares the masses of  objects using everyday language  ***Time***  **MAe-13MG** sequences events, uses everyday  language to describe the durations of events, and reads hour time on clocks  ***Three-Dimensional Space***  **MAe-14MG** manipulates, sorts and represents three-dimensional objects and describes them using everyday language  ***Two-Dimensional Space***  **MAe-15MG** manipulates, sorts and describes  representations of two-dimensional shapes, including circles, triangles, squares and rectangles, using everyday language  ***Position***  **MAe-16MG** describes position and gives and follows simple directions using everyday language |
| **Statistics and Probability**  *collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements* |
| ***Data***  **MAe-17SP** represents data and interprets data displays made from objects |

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| **STAGE ONE** | | |
| **STAGE STATEMENTS** | **SYLLABUS OBJECTIVES & OUTCOMES** | **THE NUMERACY CONTINUUM** |
| By the end of Stage 1, students ask questions and use known facts, objects, diagrams and technology to explore mathematical problems and develop mathematical fluency. They link mathematical ideas and use appropriate language and diagrams to explain strategies used.  Students count, order, read and write two- and three-digit numbers and use a range of strategies and recording methods. They use mental strategies and concrete materials to add, subtract, multiply and divide, and solve problems. Students model and describe objects and collections divided into halves, quarters and eighths. They associate collections of Australian coins with their value. They use place value to partition numbers. Students describe and continue a variety of number patterns and build number relationships. They relate addition and subtraction facts for sums to at least 20.  Students estimate, measure, compare and record using informal units for length, area, volume, capacity and mass. They recognise the need for formal units of length and use the metre and centimetre to measure length and distance. They use a calendar to identify the date and name and order the months and the seasons of the year. Students use informal units to compare and order the duration of events and tell the time on the half- and quarter-hour. They identify,  describe, sort and model particular three-dimensional objects and two-dimensional shapes. Students represent and describe the positions of objects and interpret simple maps.  Students collect, organise, display and interpret data using lists, tables and picture graphs. They recognise and describe the element of chance in everyday events. | **Working Mathematically**  *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* | **ASPECT 1**  **Counting Sequences – Verbal and Written Labels**  **Forward Number Word Sequence**   * Counts to 100 * Says the number word just after a given number word in the range 1-100 without dropping back   **Backward Number Word Sequence**   * Counts backwards from 100-1 * Says the number word just before a given number word in the range 1-100 without dropping back   **Numeral Identification** (the term ‘identify’ refers to stating the name of a displayed numeral)   * Identifies numerals in the range 1-100   **Numeral Identification**   * Identifies numerals in the range 1-1000   **Counting By 10s and 100s**   * Counts forwards and backwards by 10s to 100, eg. 10, 20........100 * Counts forwards and backwards by 100s to 1000, eg. 100, 200.........1000   **Counting By 10s and 100s**   * Counts forwards and backwards by 10s and 5s, off the decade to 100, eg. 2, 12, 22...92   **Counting By 10s and 100s**   * Counts forwards and backwards by 10s, off the decade in the range 1-1000, eg. 367, 377, 387, .....   **ASPECT 2**  **Counting as a Problem Solving Process-Early Arithmetic Strategies**  (refers to the range of counting strategies that are used to solve addition and subtraction problems)  **Figurative Counting**   * Visualises concealed items and determines the total by counting from one * May use fingers to represent the concealed items when the total of two screened parts is greater than ten.   **Counting-On-and-Back**   * Counts on or back to solve problems * A number takes a place of a completed count * Counts on rather than counting from one to solve addition or missing addends tasks * Uses count-down-from strategy, eg. 17-3 as 16, 15, 14, answer 14, or a count-down-to strategy, eg. 17-14 as 16, 15, 14, answer 3, to solve subtraction tasks   **Facile (flexible)**   * Uses known facts, number structure and other non-count-by-one strategies to solve problems (involving one or two digits)   **ASPECT 3**  **Pattern and Number Structure**  (The identification of pattern associated with the structure of numbers)  **Multiple**   * Creates a pattern of repeated units of a specified size   **Part-Whole to 20**   * Knows or easily derives number combinations to 20. For example, 7+8 might be instantly recalled or treated as one more or less than a double. Partitions numbers to 20 in both standard and non-standard form   **ASPECT 4**  **Place Value**  (Students should at least be at the Counting-On-and-Back stage to be placed on the Place Value framework)  **Ten as a Count**   * Counts on but uses single units of one or ten in counting strategies * Knows the sequence of multiples of ten, i.e. 10, 20, 30.... as a sequenced count * Treats ten as something constructed of ten *ones*, but one *ten* and ten *ones* do not exist for the student at the same time   **Tens as a Unit**   * Counts by tens and ones from the middle of the decade to find the total or difference of two 2-digit numbers where one of the numbers is represented by materials * Treats ten as a single unit while recognising that it contains ten *ones* (abstract composite unit)   **Tens and Ones**  ***2a: Jump Method***   * Treats ten as a unit that can be repeatedly constructed in place of ten individual counts. Tens and ones are flexibly regrouped. * Counts forwards or backwards firstly by tens and then by ones   ***2b: Split Method***   * Treats ten as an abstract composite unit * Solves addition and subtraction problems mentally by separating the tens from the ones, then adding or subtracting each separately before combining * Uses non-standard decomposition of two-digit numbers, eg, 76=60+16   **ASPECT 5**  **Multiplication and Division**  (Using equal groups in multiplication as well as two different types of division)  **Figurative Units**   * Uses equal grouping and counting without individual items visible * Relies on perceptual markers to represent each group * Needs to represent the groups before determining the total   **ASPECT 6**  **Fraction Units**  (Developing a quantitative sense of fractions, relies on forming partitions, relating the part to the whole, and recognising the need for equal wholes)  **Halving**   * Forms halves and quarters by repeated halving * Can use distributive dealing to share   **ASPECT 7**  **Unit Structure of Length, Area and Volume**  (Knowledge of the structure of units in length, area and volume)  **Multiple Units**   * Uses multiple units of the same size to measure an object (without gaps or overlaps) * Chooses and uses a selection of the same size and type of units to measure an object (without gaps or overlaps)   **Indirect Comparison**   * States the qualitative relationship between the size and number of units (i.e. with bigger units you need fewer of them) * Chooses and uses a selection of the same size and type of units to measure by indirect comparison |
| ***Communicating***  **MA1-1WM** describes mathematical situations and  methods using everyday and some mathematical language, actions, materials, diagrams and symbols  ***Problem Solving***  **MA1-2WM** uses objects, diagrams and technology to explore mathematical problems  ***Reasoning***  **MA1-3WM** supports conclusions by explaining or  demonstrating how answers were obtained |
| **Number and Algebra**  *develop efficient strategies for numerical calculation, recognise patterns, describe*  *relationships and apply algebraic techniques and generalisation* |
| ***Whole Numbers***  **MA1-4NA** applies place value, informally, to count,  order, read and represent two- and three-digit  numbers  ***Addition and Subtraction***  **MA1-5NA** uses a range of strategies and informal  recording methods for addition and subtraction  involving one- and two-digit numbers  ***Multiplication and Division***  **MA1-6NA** uses a range of mental strategies and  concrete materials for multiplication and division  ***Fractions and Decimals***  **MA1-7NA** represents and models halves, quarters  and eighths  ***Patterns and Algebra***  **MA1-8NA** creates, represents and continues a variety of patterns with numbers and objects |
| **Measurement and Geometry**  *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***  **MA1-9MG** measures, records, compares and estimates lengths and distances using uniform informal units, metres and centimetres  ***Area***  **MA1-10MG** measures, records, compares and  estimates areas using uniform informal units  ***Volume and Capacity***  **MA1-11MG** measures, records, compares and  estimates volumes and capacities using uniform  informal units  ***Mass***  **MA1-12MG** measures, records, compares and  estimates the masses of objects using uniform informal units  ***Time***  **MA1-13MG** describes, compares and orders  durations of events, and reads half- and quarter-hour time  ***Three-Dimensional Space***  **MA1-14MG** sorts, describes, represents and recognises familiar three-dimensional objects, including cones, cubes, cylinders, spheres and prisms  ***Two-Dimensional Space***  **MA1-15MG** manipulates, sorts, represents, describes and explores two-dimensional shapes, including quadrilaterals, pentagons, hexagons and octagons  ***Position***  **MA1-16MG** represents and describes the positions of objects in everyday situations and on maps |
| **Statistics and Probability**  *collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements* |
| ***Data***  **MA1-17SP** gathers and organises data, displays data in lists, tables and picture graphs, and interprets the results  ***Chance***  **MA1-18SP** recognises and describes the element of chance in everyday events |

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| **STAGE TWO** | | |
| **STAGE STATEMENTS** | **SYLLABUS OBJECTIVES & OUTCOMES** | **THE NUMERACY CONTINUUM** |
| By the end of Stage 2, students ask questions and use efficient mental and written strategies with increasing fluency to solve problems. They use technology to investigate mathematical concepts and check their solutions. Students use appropriate terminology to describe and link mathematical ideas, check statements for accuracy and explain their reasoning.  Students count, order, read and record numbers of up to five digits. They use informal and formal mental and written strategies to solve addition and subtraction problems. Students use mental strategies to recall multiplication facts up to 10 × 10 and related division facts. They use informal written strategies for multiplication and division of two-digit numbers by one-digit numbers. Students represent, model and compare commonly used fractions, and model,  compare and represent decimals of up to two decimal places. Students perform simple calculations with money and solve simple purchasing problems. They record, describe and complete number patterns and determine missing numbers in number sentences. Students recognise the properties of odd and even numbers.  Students estimate, measure, compare, convert and record length, area, volume, capacity and mass using formal units. They read and record time in hours and minutes, convert between units of time, and solve simple problems involving the duration of time. Students name, describe and sketch particular three-dimensional objects and two-dimensional shapes. They combine and split two-dimensional shapes to create other shapes. They compare angles using informal means and classify angles according to their size. Students use a grid-reference system to describe position, and compass points to give and follow directions. They make simple calculations using scales on maps and plans.  Students collect and organise data, and create and interpret tables and picture and column graphs. They list all possible outcomes of everyday events, and describe and compare chance events in social and experimental contexts. | **Working Mathematically**  *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***  **MA2-1WM** uses appropriate terminology to describe, and symbols to represent, mathematical ideas  ***Problem Solving***  **MA2-2WM** selects and uses appropriate mental or written strategies, or technology, to solve problems  ***Reasoning***  **MA2-3WM** checks the accuracy of a statement and  explains the reasoning used  **Number and Algebra**  *develop efficient strategies for numerical calculation, recognise patterns, describe*  *relationships and apply algebraic techniques and generalisation*  ***Whole Numbers***  **MA2-4NA** applies place value to order, read and represent numbers of up to five digits  ***Addition and Subtraction***  **MA2-5NA** uses mental and written strategies for addition and subtraction involving two-, three-, four- and five-digit numbers  ***Multiplication and Division***  **MA2-6NA** uses mental and informal written strategies for multiplication and division  ***Fractions and Decimals***  **MA2-7NA** represents, models and compares commonly used fractions and decimals  ***Patterns and Algebra***  **MA2-8NA** generalises properties of odd and even  numbers, generates number patterns, and completes simple number sentences by calculating missing values  **Measurement and Geometry**  *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***  **MA2-9MG** measures, records, compares and estimates lengths, distances and perimeters in metres, centimetres and millimetres, and measures, compares and records temperatures  ***Area***  **MA2-10MG** measures, records, compares and  estimates areas using square centimetres and square metres  ***Volume and Capacity***  **MA2-11MG** measures, records, compares and  estimates volumes and capacities using litres,  millilitres and cubic centimetres  ***Mass***  **MA2-12MG** measures, records, compares and  estimates the masses of objects using kilograms and  grams  ***Time***  **MA2-13MG** reads and records time in one-minute  intervals and converts between hours, minutes and  seconds  ***Three-Dimensional Space***  **MA2-14MG** makes, compares, sketches and names three-dimensional objects, including prisms, pyramids, cylinders, cones and spheres, and describes their features  ***Two-Dimensional Space***  **MA2-15MG** manipulates, identifies and sketches two-dimensional shapes, including special quadrilaterals, and describes their features  ***Angles***  **MA2-16MG** identifies, describes, compares and  classifies angles  ***Position***  **MA2-17MG** uses simple maps and grids to represent position and follow routes, including using compass directions  **Statistics and Probability**  *collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements*  ***Data***  **MA2-18SP** selects appropriate methods to collect data, and constructs, compares, interprets and  evaluates data displays, including tables, picture  graphs and column graphs  ***Chance***  **MA2-19SP** describes and compares chance events in social and experimental contexts | **ASPECT 1**  **Counting Sequences – Verbal and Written Labels**  **Forward Number Word Sequence**   * Counts beyond 100   **Backward Number Word Sequence**   * Counts backwards from any number   **Numeral identification**   * Identifies numerals in the range 1-10000   **Counting By 10s and 100s**   * Counts forwards and backwards by 100s, off the 100, and on or off the decade to 1000, eg. 24, 124, 224,.....924   **ASPECT 3**  **Pattern and Number Structure**  (The identification of pattern associated with the structure of numbers)  **Number Properties**   * Understands the structural properties of numbers including how to regroup when operating with numbers. For example, 9x6=6x6+3x6, 27+38+3=(27+3)+38   **ASPECT 4**  **Place Value**  (Students should at least be at the Counting-On-and-Back stage to be placed on the Place Value framework)  **Tens and Ones**  ***2a: Jump Method***   * Treats ten as a unit that can be repeatedly constructed in place of ten individual counts. Tens and ones are flexibly regrouped. * Counts forwards or backwards firstly by tens and then by ones   ***2b: Split Method***   * Treats ten as an abstract composite unit * Solves addition and subtraction problems mentally by separating the tens from the ones, then adding or subtracting each separately before combining * Uses non-standard decomposition of two-digit numbers, eg, 76=60+16   **Hundreds, Tens and Ones**  ***3a: Jump Method***   * Uses hundreds, tens and ones in standard decomposition, eg. 326 as three groups of 100, two groups of 10 and six ones * Increments by hundreds and tens to add mentally * Determines the number of tens in 621 without counting by ten   ***3b: Split Method***   * Adds and subtracts mentally combinations of numbers to 1000 * Uses the positional value of numbers flexibly in regrouping without the need to rely on incrementing by tens or hundreds * Uses a part-whole knowledge of numbers to 100   **Decimal Place Value**   * Uses tenths and hundredths to represent fractional parts with an understanding of the positional value of decimals, eg. 0.8 is larger than 0.75 because of the positional value of the digits * Interchanges tenths and hundredths, eg. 0.75 may be thought of as seven *tenths* and five *hundredths*   **ASPECT 5**  **Multiplication and Division**  (Using equal groups in multiplication as well as two different types of division)  **Multiplication and Division as Operations**   * Coordinates two composite units as an operation, eg. 6 times 3 is 18; 18÷6=3 * Uses multiplication and division as inverse operations flexibly in problem solving tasks   **ASPECT 6**  **Fraction Units**  (Developing a quantitative sense of fractions, relies on forming partitions, relating the part to the whole, and recognising the need for equal wholes)  **Equal Partitions**   * Verifies continuous and discrete linear arrangements have been partitioned into thirds or fifths by iterating one part to form the whole or checking the equality and number of parts forming the whole   **ASPECT 7**  **Unit Structure of Length, Area and Volume**  (Knowledge of the structure of units in length, area and volume)  **Iterates the unit**   * Uses a single unit repeatedly (iterating) to measure or construct length * Make a multi-unit ruler by iterating a single unit and quantifying accumulated distance * Identifies the quantitative relationship between length and number of units (ie. If you halve the size of the units you will have twice as many units to measure)   **Composite Area**   * Creates the row-column structure of the iterated composite unit of area * Uses the row-column structure to find the number of units to measure area   **Repeated Layers**   * Creates the row-column-layer structure of the iterated layers when measuring volume * Uses the row-column-layer structure to find the number of units to measure volume |

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| **STAGE THREE** | | |
| **STAGE STATEMENTS** | **SYLLABUS OBJECTIVES & OUTCOMES** | **THE NUMERACY CONTINUUM** |
| By the end of Stage 3, students ask questions and undertake investigations, selecting appropriate technological applications and problem-solving strategies to demonstrate fluency in mathematical techniques. They use mathematical terminology and some conventions, and they give valid reasons when comparing and selecting from possible solutions, making connections with existing knowledge and understanding.  Students select and apply appropriate mental, written or calculator strategies for the four operations and check the reasonableness of answers using estimation. They solve word problems and apply the order of operations to number sentences where required. Students identify factors and multiples and recognise the properties of prime, composite, square and triangular numbers. They connect fractions, decimals and percentages as different representations of the same value. Students compare, order and perform calculations with simple fractions, decimals and percentages and apply the four operations to money in real-life situations. Students record, describe and continue geometric and number patterns, and they find missing numbers in number sentences. They locate an ordered pair in any one of the four quadrants on the Cartesian plane.  Students select and use the appropriate unit to estimate, measure and calculate length, area, volume, capacity and mass. They make connections between capacity and volume, and solve problems involving length and area. Students use 24-hour time in real-life situations, construct and interpret timelines and use timetables. They convert between units of length, units of capacity and units of mass. They construct and classify three-dimensional objects and two-dimensional shapes, and compare and describe their features, including line and rotational symmetries. Students measure and construct angles, and find unknown angles in diagrams using known angle results. They use a grid-reference system to locate landmarks and describe routes using landmarks and directional language.  Students use appropriate data collection methods to interpret and analyse sets of data and construct a range of data displays. They assign probabilities as fractions, decimals  or percentages in simple chance experiments. | **Working Mathematically**  *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***  **MA3-1WM** describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions  ***Problem Solving***  **MA3-2WM** selects and applies appropriate problem solving strategies, including the use of digital technologies, in undertaking  investigations  ***Reasoning***  **MA3-3WM** gives a valid reason for supporting one possible solution over another  **Number and Algebra**  *develop efficient strategies for numerical calculation, recognise patterns, describe relationships and apply algebraic techniques and generalisation*  ***Whole Numbers***  **MA3-4NA** orders, reads and represents integers of any  size and describes properties of whole numbers  ***Addition and Subtraction***  **MA3-5NA** selects and applies appropriate strategies for  addition and subtraction with counting numbers of any size  ***Multiplication and Division***  **MA3-6NA** selects and applies appropriate strategies for  multiplication and division, and applies the order of  operations to calculations involving more than one  operation  ***Fractions, Decimals and Percentages***  **MA3-7NA** compares, orders and calculates with fractions,  decimals and percentages  **Measurement and Geometry**  *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***  **MA3-9MG** selects and uses the appropriate unit and device to measure lengths and distances, calculates  perimeters, and converts between units of length  ***Area***  **MA3-10MG** selects and uses the appropriate unit to  calculate areas, including areas of squares, rectangles and triangles  ***Volume and Capacity***  **MA3-11MG** selects and uses the appropriate unit to  estimate, measure and calculate volumes and capacities, and converts between units of capacity  ***Mass***  **MA3-12MG** selects and uses the appropriate unit and  device to measure the masses of objects, and converts between units of mass  ***Time***  **MA3-13MG** uses 24-hour time and am and pm notation in  real-life situations, and constructs timelines  ***Three-Dimensional Space***  **MA3-14MG** identifies three dimensional objects, including  prisms and pyramids, on the basis of their properties, and  visualises, sketches and constructs them given drawings of different views  ***Two-Dimensional Space***  **MA3-15MG** manipulates, classifies and draws two dimensional shapes, including equilateral, isosceles and  scalene triangles, and describes their properties  ***Angles***  **MA3-16MG** measures andconstructs angles, andapplies angle relationships tofind unknown angles  ***Position***  **MA3-17MG** locates and describes position on maps  using a grid-reference system  **Statistics and Probability**  *collect, represent, analyse, interpret and evaluate data, assign and use probabilities, and make sound judgements*  ***Data***  **MA3-18SP** uses appropriate methods to collect data and  constructs, interprets and evaluates data displays,  including dot plots, line graphs and two-way tables  ***Chance***  **MA3-19SP** conducts chance experiments and assigns  probabilities as values between 0 and 1 to describe their outcomes | **ASPECT 3**  **Pattern and Number Structure**  (The identification of pattern associated with the structure of numbers)  **Number Properties**   * Understands the structural properties of numbers including how to regroup when operating with numbers. For example, 9x6=6x6+3x6, 27+38+3=(27+3)+38   **ASPECT 4**  **Place Value**  (Students should at least be at the Counting-On-and-Back stage to be placed on the Place Value framework)  **System Place Value**   * Recognises that the place value system can be extended indefinitely in two directions – to the left and right of the decimal point * Recognises the relationship between values of adjacent places (units) in a numeral   **ASPECT 6**  **Fraction Units**  (Developing a quantitative sense of fractions, relies on forming partitions, relating the part to the whole, and recognising the need for equal wholes)  **Reforms the Whole**   * When iterating a fraction part such as one-third beyond the whole, re-forms the whole   **ASPECT 7**  **Unit Structure of Length, Area and Volume**  (Knowledge of the structure of units in length, area and volume)  **Composite Area**   * Creates the row-column structure of the iterated composite unit of area * Uses the row-column structure to find the number of units to measure area   **Repeated Layers**   * Creates the row-column-layer structure of the iterated layers when measuring volume   Uses the row-column-layer structure to find the number of units to measure volume |