Asia Education Foundation   **Sample mapping of Asia opportunities in the Australian Curriculum – MATHEMATICS (Foundation to Year 10)**

Year Level	Level Description	Content Description and *Elaboration*
Foundation	At this year level: *Understanding* includes connecting names, numerals and quantities *Fluency* includes readily counting numbers in sequences, continuing patterns, and comparing the lengths of objects *Problem Solving* includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer *Reasoning* includes explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length.	*reading stories from other cultures featuring counting in sequence to assist students to recognise ways of counting in local languages and across cultures (ACMNA001)* *using scenarios to help students recognise that other cultures count in a variety of ways, such as by placing one pebble in a bag to represent one object (ACMNA002)* *using objects which are personally and culturally relevant to students (ACMNA289)*
Year 1	At this year level: *Understanding* includes connecting names, numerals and quantities, and partitioning numbers in various ways *Fluency* includes counting number in sequences readily forward and backwards, locating numbers on a line, and naming the days of the week *Problem Solving* includes using materials to model authentic problems, giving and receiving directions to unfamiliar places, and using familiar counting sequences to solve unfamiliar problems and discussing the reasonableness of the answer *Reasoning* includes explaining direct and indirect comparisons of length using uniform informal units, justifying representations of data, and explaining patterns that have been created.	*using the popular Korean counting game (sam-yuk-gu) for skip counting (ACMNA012)* *showing that coins are different in other countries by comparing Asian coins to Australian coins (ACMNA017)*
Year 2	At this year level: *Understanding* includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division *Fluency* includes counting numbers in sequences readily, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations *Problem Solving* includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape *Reasoning* includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, and creating and interpreting simple representations of data.	*using an abacus to model and represent numbers (ACMNA028)* *using calendars to locate specific information, such as finding a given date on a calendar and saying what day it is, and identifying personally or culturally specific days (ACMMG041)*
Year 3	At this year level: *Understanding* includes connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry *Fluency* includes recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions *Problem Solving* includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns *Reasoning* includes using generalising from number properties and results of calculations, comparing angles, creating and interpreting variations in the results of data collections and data displays.	*recognising that in English the term 'one third' is used (order: numerator, denominator) but that in other languages this concept may be expressed as 'three parts, one of them' (order: denominator, numerator) for example Japanese (ACMNA058)* *recognising the relationship between dollars and cents, and that not all countries use these denominations and divisions (for example Japanese Yen) (ACMNA059)* *exploring the creation of three-dimensional objects using origami, including prisms and pyramids (ACMMG063)*
Year 4	At this year level: *Understanding* includes making connections between representations of numbers, partitioning and combining numbers flexibly, extending place value to decimals, using appropriate language to communicate times, and describing properties of symmetrical shapes *Fluency* includes recalling multiplication tables, communicating sequences of simple fractions, using instruments to measure accurately, creating patterns with shapes and their transformations, and collecting and recording data *Problem Solving* includes formulating, modelling and recording authentic situations involving operations, comparing large numbers with each other, comparing time durations, and using properties of numbers to continue patterns *Reasoning* includes using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays.	*recognising that not all countries use dollars and cents, eg India uses rupees (ACMNA080)* *Carrying out calculations in another currency as well as in dollars and cents, and identifying both as decimal systems (ACMNA080)* *recognising that metric units are not the only units used throughout the world, for example measuring the area of floor space using tatami mats (Japan), using squares for room and house area (Australia) (ACMMG290)* *identifying the scale used on maps of cities and rural areas in Australia and a city in Indonesia and describing the difference (ACMMG090)* *using stimulus materials such as the motifs in Central Asian textiles, Tibetan artefacts, Indian lotus designs and symmetry in Yolngu or Central and Western Desert art (ACMMG091)*
Year 5	At this year level: *Understanding* includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways, describing transformations and identifying line and rotational symmetry *Fluency* includes choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles *Problem Solving* includes formulating and solving authentic problems using whole numbers and measurements and creating financial plans *Reasoning* includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals, interpreting results of chance experiments, posing appropriate questions for data investigations and interpreting data sets.	*investigating alternative measures of scale to demonstrate that these vary between countries and change over time, for example temperature measurement in Australia, Indonesia, Japan and USA (ACMMG108)* *commenting on the likelihood of winning simple games of chance by considering the number of possible outcomes and the consequent chance of winning in simple games of chance such as jan-ken-pon (rock-paper-scissors) (ACMSP116)*
Year 6	At this year level: *Understanding* includes describing properties of different sets of numbers, using fractions and decimals to describe probabilities, representing fractions and decimals in various ways and describing connections between them, and making reasonable estimations *Fluency* includes representing integers on a number line, calculating simple percentages, using brackets appropriately, converting between fractions and decimals, using operations with fractions, decimals and percentages, measuring using metric units, and interpreting timetables *Problem Solving* includes formulating and solving authentic problems using fractions, decimals, percentages and measurements, interpreting secondary data displays, and finding the size of unknown angles *Reasoning* includes explaining mental strategies for performing calculations, describing results for continuing number sequences, explaining the transformation of one shape into another, explaining why the actual results of chance experiments may differ from expected results.	*considering the history and significance of pyramids from a range of cultural perspectives including those structures found in China, Korea and Indonesia (ACMMG140)* *investigating games of chance popular in different cultures and evaluating the relative benefits to the organisers and participants (for example Pachinko) (ACMSP144)*

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Year 7	At this year level: Understanding includes describing patterns in uses of indices with whole numbers, recognising equivalences between fractions, decimals, percentages and ratios, plotting points on the Cartesian plane, identifying angles formed by a transversal crossing a pair of lines, and connecting the laws and properties of numbers to algebraic terms and expressions Fluency includes calculating accurately with integers, representing fractions and decimals in various ways, investigating best buys, finding measures of central tendency and calculating areas of shapes and volumes of prisms Problem Solving includes formulating and solving authentic problems using numbers and measurements, working with transformations and identifying symmetry, calculating angles and interpreting sets of data collected through chance experiments Reasoning includes applying the number laws to calculations, applying known geometric facts to draw conclusions about shapes, applying an understanding of ratio and interpreting data displays.	*obtaining secondary data from newspapers, the Internet and the Australian Bureau of Statistics (ACMSP169)* *investigating secondary data relating to the distribution and use of non-renewable resources around the world (ACMSP169)*
Year 8	At this year level: Understanding includes describing patterns involving indices and recurring decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules for linear relations their graphs, explaining the purpose of statistical measures, and explaining measurements of perimeter and area Fluency includes calculating accurately with simple decimals, indices and integers, recognising equivalence of common decimals and fractions including recurring decimals, factorising and simplifying basic algebraic expressions, and evaluating perimeters, areas of common shapes and their volumes and three dimensional objects Problem Solving includes formulating, and modelling practical situations involving ratios, profit and loss, areas and perimeters of common shapes, and using two-way tables and Venn diagrams to calculate probabilities Reasoning includes justifying the result of a calculation or estimation as reasonable, deriving probability from its complement, using congruence to deduce properties of triangles, finding estimates of means and proportions of populations.	*calculating population growth rates in Australia and Asia and explaining their difference (ACMNA188)* *identifying regions in Australia and countries in Asia that are in the same time zone (ACMMG199)*
Year 9	At this year level: Understanding includes describing the relationship between graphs and equations, simplifying a range of algebraic expressions, explaining the use of relative frequencies to estimate probabilities, and the use of the trigonometric ratios for right-angle triangles Fluency includes applying the index laws to expressions with integer indices, expressing numbers in scientific notation, listing outcomes for experiments and developing familiarity with calculations involving the Cartesian plane and calculating areas of shapes and surface areas of prisms Problem Solving includes formulating, and modelling practical situations involving surface areas and volumes of right prisms, applying ratio and scale factors to similar figures, solving problems involving right-angle trigonometry, and collecting data from secondary sources to investigate an issue Reasoning includes following mathematical arguments, evaluating media reports and using statistical knowledge to clarify situations, developing strategies in investigating similarity and sketching linear graphs.	*investigating a range of data and its sources, for example the age of residents in Australia, Cambodia and Tonga; the number of subjects studied at school in a year by 14-year-old students in Australia, Japan and Timor-Leste (ACMSP227)* *comparing the annual rainfall in various parts of Australia, Pakistan, New Guinea and Malaysia (ACMSP228)*
Year 10	At this year level: Understanding includes applying the four operations to algebraic fractions, finding unknowns in formulas after substitution, making the connection between equations of relations and their graphs, comparing simple and compound interest in financial contexts and determining probabilities of two and three step experiments Fluency includes factorising and expanding algebraic expressions, using a range of strategies to solve equations and using calculations to investigate the shape of data sets Problem Solving includes calculating the surface area and volume of a diverse range of prisms to solve practical problems, finding unknown lengths and angles using applications of trigonometry, using algebraic and graphical techniques to find solutions to simultaneous equations and inequalities, and investigating independence of events Reasoning includes formulating geometric proofs involving congruence and similarity, interpreting and evaluating media statements and interpreting and comparing data sets.	*investigating the use of statistics in reports regarding the growth of Australia's trade with other countries of the Asia region (ACMSP253)*