Australian Curriculum Mathematics Alignment Document_V8.2		Year 8
Content Descriptors	**Elaborations**	**Math-U-See links**
Number and Algebra		
Number and Place Value	**Honours pre-algebra lesson 30 – developing reasoning and problem solving** **Honours algebra 1 lesson 1, 2, 3 – developing reasoning and problem solving**	
Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182)	• evaluating numbers expressed as powers of positive integers	Zeta lesson 1, 2 Pre-algebra lesson 5, 6 Algebra 1 lesson 17 Algebra 2 lesson 1
Carry out the four operations with rational numbers and integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)	• using patterns to assist in finding rules for the multiplication and division of integers • using the number line to develop strategies for adding and subtracting rational numbers	Pre-algebra lesson 1, 2, 3, 4, 7, 21, 22
Real numbers		
Investigate terminating and recurring decimals (ACMNA184)	• recognising terminating, recurring and non-terminating decimals and choosing their appropriate representations	Zeta lesson 21
Investigate the concept of irrational numbers, including π (ACMNA186)	• understanding that the real number system includes irrational numbers	Geometry lesson 17 Algebra 1 lesson 5
Solve problems involving the use of percentages, including percentage increases and decreases, with and without digital technologies (ACMNA187)	• using percentages to solve problems, including those involving mark-ups, discounts and GST • using percentages to calculate population increases and decreases	Zeta lesson 11, 12 *Honours pre-algebra lesson 19, 20* Algebra 2 lesson 14
Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)	• understanding that rate and ratio problems can be solved using fractions or percentages and choosing the most efficient form to solve a particular problem • calculating population growth rates in Australia and Asia and explaining their difference	Pre-algebra lesson 20 Algebra 2 lesson 17
Money and financial mathematics		
Solve problems involving profit and loss, with and without digital technologies (ACMNA189)	• expressing profit and loss as a percentage of cost or selling price, comparing the difference • investigating the methods used in retail stores to express discounts	*Honours algebra 1 lesson 24, 25* Algebra 2 lesson 14-2

Patterns and algebra		
Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)	• applying the distributive law to the expansion of algebraic expressions using strategies such as the area model	Pre-algebra lesson 12, 13 *Honours pre-algebra lesson 25*
Factorise algebraic expressions by identifying numerical factors (ACMNA191)	• recognising the relationship between factorising and expanding • identifying the greatest common divisor (highest common factor) of numeric and algebraic expressions and using a range of strategies to factorise algebraic expressions	
Simplify algebraic expressions involving the four operations (ACMNA192)	• understanding that the laws used with numbers can also be used with algebra	Pre-algebra lesson 9, 19, 23 *Honours pre-algebra lesson 23* Algebra 1 lesson 3, 16, 19 (addition) Algebra 2 lesson 15
Linear and non-linear relationships		
Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)	• completing a table of values, plotting the resulting points and determining whether the relationship is linear • finding the rule for a linear relationship	Algebra 1 lesson 6, 8, 9 *Honours algebra 1 lesson 10, 18*
Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)	• solving real life problems by using variables to represent unknowns	Pre-algebra lesson 9, 16, 17 *Honours algebra 1 lesson 8, 10, 13, 18*

Measurement and Geometry		
Using units of measurement		
Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)	• choosing units for area including mm^2, cm^2, m^2, hectares, km^2, and units for volume including mm^3, cm^3, m^3 • recognising that the conversion factors for area units are the squares of those for the corresponding linear units • recognising that the conversion factors for volume units are the cubes of those for the corresponding linear units	*Honours geometry lesson 15* *Honours pre-algebra lesson 24*
Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites (ACMMG196)	• establishing and using formulas for areas such as trapeziums, rhombuses and kites	Delta lesson 8, 13 Geometry lesson 8, 9 *Honours geometry lesson 9, 12* *Honours pre-algebra lesson 3, 4*
Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)	• investigating the circumference and area of circles with materials or by measuring, to establish an understanding of formulas • investigating the area of circles using a square grid or by rearranging a circle divided into sectors	Epsilon lesson 27 Zeta lesson 16, 23 Geometry lesson 12, 13 (definitions only) *Honours geometry lesson 12, 16* *Honours pre-algebra lesson 3, 4, 5*
Develop formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)	• investigating the relationship between volumes of rectangular and triangular prisms	Geometry lesson 14, 15 *Honours geometry lesson 16, 19*
Solve problems involving duration, including using 12- and 24-hour time within a single time zone (ACMMG199)	• identifying regions in Australia and countries in Asia that are in the same time zone	Pre-algebra lesson 26, 28 *Honours pre-algebra lesson 4*
Geometric reasoning	**Geometry lessons 1 and 2 are good for review and setting the scene for develop geometric reasoning.** **Honours geometry lesson 1, 11, 22 support the development of logical thinking and reasoning**	
Define congruence of plane shapes using transformations (ACMMG200)	• understanding the properties that determine congruence of triangles and recognising which transformations create congruent figures • establishing that two figures are congruent if one shape lies exactly on top of the other after one or more transformations (translation, reflection, rotation), and recognising that the matching sides and the matching angles are equal	Zeta lesson 28 Geometry lesson 23

Develop the conditions for congruence of triangles (ACMMG201)	• investigating the minimal conditions needed for the unique construction of triangles, leading to the establishment of the conditions for congruence (SSS, SAS, ASA and RHS) • solving problems using the properties of congruent figures • constructing triangles using the conditions for congruence	Geometry lesson 24, 25, 26
Establish properties of quadrilaterals using congruent triangles and angle properties, and solve related numerical problems using reasoning (ACMMG202)	• establishing the properties of squares, rectangles, parallelograms, rhombuses, trapeziums and kites • identifying properties related to side lengths, parallel sides, angles, diagonals and symmetry	Geometry lesson 23 *Honours geometry lesson 8, 24, 25, 26*

Statistics and Probability

Chance

Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)	• identifying the complement of familiar events • understanding that probabilities range between 0 to 1 and that calculating the probability of an event allows the probability of its complement to be found	
Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and' (ACMSP205)	• posing 'and', 'or' and 'not' probability questions about objects or people	Geometry lesson 2 (set terminology)
Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)	• using Venn diagrams and two-way tables to calculate probabilities for events, satisfying 'and', 'or' and 'not' conditions • understanding that representing data in Venn diagrams or two-way tables facilitates the calculation of probabilities • collecting data to answer the questions using Venn diagrams or two-way tables	*Honours geometry lesson 2, 3*

Data representation and interpretation

Investigate techniques for collecting data, including census, sampling and observation (ACMSP284)	• identifying situations where data can be collected by census and those where a sample is appropriate	
Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206)	• investigating the uses of random sampling to collect data	
Explore the variation of means and proportions of random samples drawn from the same population (ACMSP293)	• using sample properties to predict characteristics of the population	
Investigate the effect of individual data values, including outliers, on the mean, and median (ACMSP207)	• using displays of data to explore and investigate effects	*Honours pre-algebra lesson 27*