

Australian Curriculum Mathematics Alignment Document_V8.2		Year 9
Content Descriptors	Elaborations	Math-U-See links
<b>Number and Algebra</b>		
<b>Real numbers</b>	<b>Honours pre-algebra lesson 30 – developing reasoning and problem solving Honours algebra 1 lesson 1, 2, 3 – developing reasoning and problem solving</b>	
Solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems (ACMNA208)	<ul style="list-style-type: none"> <li>identifying direct proportion in real-life contexts</li> </ul>	Pre-algebra lesson 19, 20 <i>Honours pre-algebra lesson 19, 20</i>  Algebra 2 lesson 18, 19, 28-3, 28-4, 29-2, 29-3 <i>Honours algebra 2 lesson 2, 3, 4, 5, 16, 19</i>
Apply index laws to numerical expressions with integer indices (ACMNA209)	<ul style="list-style-type: none"> <li>simplifying and evaluating numerical expressions, using involving both positive and negative integer indices</li> </ul>	Pre-algebra lesson 5, 6, 7  Algebra 1 lesson 17, 18 <i>Honours algebra 1 lesson 21, 22 26</i>  Algebra 2 lesson 1
Express numbers in scientific notation (ACMNA210)	<ul style="list-style-type: none"> <li>representing extremely large and small numbers in scientific notation, and numbers expressed in scientific notation as whole numbers or decimals</li> </ul>	Algebra 1 lesson 31 <i>Honours algebra 1 lesson 31, 33</i>  Algebra 2 lesson 3 <i>Honours algebra 2 lesson 3, 4</i>
<b>Money and financial mathematics</b>		
Solve problems involving simple interest (ACMNA211)	<ul style="list-style-type: none"> <li>understanding that financial decisions can be assisted by mathematical calculations</li> </ul>	<i>Honours algebra 1 lesson 15, 16, 24, 25</i>
<b>Patterns and algebra</b>		
Extend and apply the index laws to variables, using positive integer indices and the zero index (ACMNA212)	<ul style="list-style-type: none"> <li>understanding that index laws apply to variables as well as numbers</li> </ul>	Algebra 1 lesson 17, 18, 25 <i>Honours algebra 1 lesson 21</i>  Algebra 2 lesson 3
Apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate (ACMNA213)	<ul style="list-style-type: none"> <li>understanding that the distributive law can be applied to algebraic expressions as well as numbers</li> <li>understanding the relationship between expansion and factorisation and identifying algebraic factors in algebraic expressions</li> </ul>	Pre-algebra lesson 25 <i>Honours pre-algebra 1 lesson 25</i>  Algebra 1 lesson 16, 19, 20, 21, 22, 23, 24, 25

		<p><i>Honours algebra 1 lesson 23, 26</i></p> <p>Algebra 2 lesson 2, 5-3, 15, 28-2, 28-1</p> <p><i>Honours algebra 2 lesson 15, 23</i></p>
<b>Linear and non-linear relationships</b>		
Find the distance between two points located on the Cartesian plane using a range of strategies, including graphing software (ACMNA214)	<ul style="list-style-type: none"> <li>investigating graphical and algebraic techniques for finding distance between two points</li> <li>using Pythagoras' theorem to calculate distance between two points</li> </ul>	Algebra 2 lesson 22
Find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software (ACMNA294)	<ul style="list-style-type: none"> <li>investigating graphical and algebraic techniques for finding midpoint and gradient</li> <li>recognising that the gradient of a line is the same as the gradient of any line segment on that line</li> </ul>	<p>Algebra 1 lesson 20, 22</p> <p><i>Honours algebra 1 lesson 7</i></p> <p>Algebra 2 lesson 3</p>
Sketch linear graphs using the coordinates of two points and solve linear equations (ACMNA215)	<ul style="list-style-type: none"> <li>determining linear rules from suitable diagrams, tables of values and graphs and describing them using both words and algebra</li> </ul>	<p>Algebra 1 lesson 6, 7, 8, 9, 10</p> <p><i>Honours algebra 1 lesson 10, 11, 13, 18</i></p> <p><i>Honours algebra 2 lesson 29</i></p>
Graph simple non-linear relations with and without the use of digital technologies and solve simple related equations (ACMNA296)	<ul style="list-style-type: none"> <li>graphing parabolas, and circles connecting x-intercepts of a graph to a related equation</li> </ul>	<p>Algebra 1 lesson 26</p> <p><i>Honours algebra 1 lesson 19, 20</i></p> <p>Algebra 2 lesson 23-2, 23-3, 24, 26</p> <p><i>Honours algebra 2 lesson 21, 22</i></p>

**Measurement and Geometry****Using units of measurement**

Calculate areas of composite shapes (ACMMG216)	<ul style="list-style-type: none"> <li>understanding that partitioning composite shapes into rectangles and triangles is a strategy for solving problems involving area</li> </ul>	<i>Honours geometry lesson 9, 13</i> <i>Honours pre-algebra lesson 15</i> <i>Honours algebra 2 lesson 18</i>
Calculate the surface area and volume of cylinders and solve related problems (ACMMG217)	<ul style="list-style-type: none"> <li>analysing nets of cylinders to establish formulas for surface area</li> <li>connecting the volume and capacity of a cylinder to solve authentic problems</li> </ul>	Geometry lesson 14, 16 <i>Honours geometry lesson 14, 16</i> Pre-algebra lesson 24
Solve problems involving the surface area and volume of right prisms (ACMMG218)	<ul style="list-style-type: none"> <li>solving practical problems involving surface area and volume of right prisms</li> </ul>	Geometry lesson 15, 16 <i>Honours geometry lesson 15, 16, 19</i> Pre-algebra lesson 15, 27 <i>Honours algebra 2 lesson 18</i>
Investigate very small and very large time scales and intervals (ACMMG219)	<ul style="list-style-type: none"> <li>investigating the usefulness of scientific notation in representing very large and very small numbers</li> </ul>	Algebra 1 lesson 31 <i>Honours algebra 1 lesson 31, 33</i>

**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**

Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar (ACMMG220)	<ul style="list-style-type: none"> <li>establishing the conditions for similarity of two triangles and comparing this to the conditions for congruence</li> <li>using the properties of similarity and ratio, and correct mathematical notation and language, to solve problems involving enlargement (for example, scale diagrams)</li> <li>using the enlargement transformation to establish similarity, understanding that similarity and congruence help describe relationships between geometrical shapes and are important elements of reasoning and proof</li> </ul>	Geometry lesson 27
Solve problems using ratio and scale factors in similar figures (ACMMG221)	<ul style="list-style-type: none"> <li>establishing the relationship between areas of similar figures and the ratio of corresponding sides (scale factor)</li> </ul>	Geometry lesson 27 <i>Honours geometry lesson 10, 20</i> <i>Honours algebra 2 lesson 5, 6</i>

**Pythagoras and trigonometry**

Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles (ACMMG222)	<ul style="list-style-type: none"> <li>understanding that Pythagoras' Theorem is a useful tool in determining unknown lengths in right-angled triangles and has widespread applications</li> </ul>	Geometry lesson 18, 20, 21 <i>Honours geometry lesson 18, 21</i>
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	<ul style="list-style-type: none"> <li>recognising that right-angled triangle calculations may generate results that can be integers, fractions or irrational numbers</li> </ul>	<p>Pre-algebra 1 lesson 11 <i>Honours pre-algebra lesson 10, 13</i></p> <p>Algebra 2 lesson 31-1</p>
Use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles (ACMMG223)	<ul style="list-style-type: none"> <li>developing understanding of the relationship between the corresponding sides of similar right-angled triangles</li> </ul>	<p>Geometry lesson 26, 27 <i>Honours geometry lesson 29</i></p>
Apply trigonometry to solve right-angled triangle problems (ACMMG224)	<ul style="list-style-type: none"> <li>understanding the terms 'adjacent' and 'opposite' sides in a right-angled triangle</li> <li>selecting and accurately using the correct trigonometric ratio to find unknown sides (adjacent, opposite and hypotenuse) and angles in right-angled triangles</li> </ul>	<p>Geometry lesson 29 <i>Honours geometry lesson 30</i></p> <p>Algebra 2 lesson 31-4, 31-5</p>

**Statistics and Probability****Chance**

List all outcomes for two-step chance experiments, both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events (ACMSP225)	<ul style="list-style-type: none"><li>conducting two-step chance experiments</li><li>using systematic methods to list outcomes of experiments and to list outcomes favourable to an event</li><li>comparing experiments which differ only by being undertaken with replacement or without replacement</li></ul>	Geometry lesson 2 (set terminology)
Calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' (ACMSP226)	<ul style="list-style-type: none"><li>using Venn diagrams or two-way tables to calculate relative frequencies of events involving 'and', 'or' questions</li><li>using relative frequencies to find an estimate of probabilities of 'and', 'or' events</li></ul>	
Investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians (ACMSP227)	<ul style="list-style-type: none"><li>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</li></ul>	

**Data representation and interpretation**

Identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly and from secondary sources (ACMSP228)	<ul style="list-style-type: none"><li>comparing the annual rainfall in various parts of Australia, Pakistan, New Guinea and Malaysia</li></ul>	
Construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' (ACMSP282)	<ul style="list-style-type: none"><li>using stem-and-leaf plots to compare two like sets of data such as the heights of girls and the heights of boys in a class</li><li>describing the shape of the distribution of data using terms such as 'positive skew', 'negative skew' and 'symmetric' and 'bi-modal'</li></ul>	
Compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread (ACMSP283)	<ul style="list-style-type: none"><li>comparing means, medians and ranges of two sets of numerical data which have been displayed using histograms, dot plots, or stem and leaf plots</li></ul>	<i>Honours pre-algebra lesson 27</i>