

## Mapping tool – preamble for Mathematics

This mapping tool matches essential content elements from two curriculum frameworks: *Every chance to learn* ELA 16, ELA 17 and ELA 18 to the Australian Curriculum (Mathematics) V1.1. Teachers using this tool are reminded to consider the underlying principles and philosophy as well.

The **Overview** of each ELA in *Every chance to learn* discusses the scope, features, concepts, values and attitudes of

- ELA 16 *The student understands and applies number*
- ELA 17 *The student chooses and uses measures*
- ELA 18 *The student recognises and represents patterns and relationships*

The **Rationale** of the Australian Curriculum (Mathematics) reminds readers that the three interrelated strands have different intentions:

- The *Statistics and Probability* strand supports students recognising and analysing data and drawing inferences.
- The *Measurement and Geometry* strand supports students developing an increasingly sophisticated understanding of size, shape, relative position and movement of two-dimensional figures in the plane and three-dimensional objects in space.
- The *Number and Algebra* strand supports the exploration of number representation, computation, patterns and relationships.

Further information can be inferred from

- opening **hyperlinked codes** to the Australian Curriculum, and pasting them into the 'search' function to identify content elaborations, general capabilities and links to cross-curriculum priorities.

## Mathematics – Early Adolescence

Every chance to learn		Australian Curriculum		
16. The student understands and applies number		Number and algebra		
		Year 6	Year 7	Year 8
<b>16.EA.1</b>	the base 10 number system and its number properties	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Identify and describe properties of prime, composite, square and triangular numbers (ACMNA122)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Investigate index notation and represent numbers as a products of powers of prime numbers (ACMNA149)</li> </ul>	
<b>16.EA.2</b>	positive and negative numbers to at least seven digits and decimal fractions to at least three decimal places	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Investigate everyday situations that use positive and negative whole numbers and zero. Locate and represent them on a number line (ACMNA124)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Round decimals to a specified number of decimal places (ACMNA156)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Investigate terminating and recurring decimals (ACMNA184)</li> </ul>
<b>16.EA.3</b>	addition, subtraction and multiplication, including small whole number powers and division using one- and two digit whole number divisors	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Carry out the four operations with integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)</li> </ul>
<b>16.EA.4</b>	common fractions and families of equivalent fractions, including those expressed in simplest	<b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Compare fractions with related denominators and locate and represent them on a number</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Compare fractions using equivalence. Locate and represent fractions and mixed</li> </ul>	

	form and as decimals and percentages	<p>line (ACMNA125)</p> <ul style="list-style-type: none"> <li>• Make connections between equivalent fractions, decimals and percentages (ACMNA131)</li> </ul>	<p>numerals on a number line (ACMNA152)</p> <ul style="list-style-type: none"> <li>• Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)</li> </ul>	
<b>16.EA.5</b>	addition and subtraction of fractions where a common denominator is readily identifiable, and multiplication and simple division of fractions	<p><b>Fractions and decimals</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126)</li> <li>• Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies (ACMNA127)</li> </ul>	<p><b>Real numbers</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving addition and subtraction of fractions (including those with unrelated denominators) (ACMNA153)</li> <li>• Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)</li> </ul>	
<b>16.EA.6</b>	problems that involve simple percentages, proportions, ratios and rates in practical situations, including money, time and other measurements	<p><b>Money and financial mathematics</b></p> <ul style="list-style-type: none"> <li>• Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies (ACMNA132)</li> </ul>	<p><b>Real numbers</b></p> <ul style="list-style-type: none"> <li>• Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (ACMNA158)</li> <li>• Express one quantity as a fraction of another with and without the use of digital technologies (ACMNA155)</li> <li>• Recognise and solve problems involving simple ratios (ACMNA173)</li> </ul> <p><b>Money and financial mathematics</b></p>	<p><b>Real numbers</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving use of percentages, including percentage increase and decrease, with and without digital technologies (ACMNA187)</li> <li>• Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)</li> </ul> <p><b>Money and financial mathematics</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving profit and loss, with and without digital technologies</li> </ul>

			<ul style="list-style-type: none"> <li>Investigate and calculate best buys, with and without digital technologies (ACMNA174)</li> </ul>	(ACMNA189)
<b>16.EA.7</b>	relationships between whole numbers, decimal fractions, percentages and common fractions	<b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Make connections between equivalent fractions, decimals and percentages (ACMNA131)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)</li> </ul>	
<b>16.EA.8</b>	magnitude of numbers based on powers of 10	<p style="text-align: center;">Not addressed in Australian Curriculum</p> <p style="text-align: center;">Concept is useful for developing understanding for scientific notation</p>		
<b>16.EA.9</b>	equivalences between linear expressions to solve linear equations (e.g. 'backtracking')		<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)</li> <li>Write algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)</li> <li>Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul> <b>Linear and non-linear relationships</b> <ul style="list-style-type: none"> <li>Solve simple linear equations (ACMNA179)</li> </ul>	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)</li> <li>Factorise algebraic expressions by identifying numerical factors (ACMNA191)</li> <li>Simplify algebraic expressions involving the four operations (ACMNA192)</li> </ul> <b>Linear and non-linear relationships</b> <ul style="list-style-type: none"> <li>Solve linear equations using algebraic and (graphical techniques). Verify solutions using substitution (ACMNA194)</li> </ul>
<b>16.EA.10</b>	the contributions of different cultures to the development of	<p style="text-align: center;">Not addressed in Australian Curriculum</p> <p style="text-align: center;">The content is useful for building students' deep understand of number and different cultural aspects</p>		

	number systems and mathematical knowledge throughout history			
<b>16.EA.11</b>	compare and order sets of positive and negative numbers and decimal fractions	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Investigate everyday situations that use positive and negative whole numbers and zero. Locate and represent them on a number line (ACMNA124)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Compare, order, add and subtract integers (ACMNA280)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Investigate terminating and recurring decimals (ACMNA184)</li> </ul>
<b>16.EA.12</b>	represent and order common fractions and identify families of equivalent fractions, including simple forms, decimals and percentages	<b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Compare fractions with related denominators and locate and represent them on a number line (ACMNA125)</li> <li>Make connections between equivalent fractions, decimals and percentages (ACMNA131)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Compare fractions using equivalence. Locate and represent fractions and mixed numerals on a number line (ACMNA152)</li> <li>Connect fractions, decimals and percentages and carry out simple conversions (ACMNA157)</li> </ul>	
<b>16.EA.13</b>	explore general number properties and apply these to computation	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Carry out the four operations with integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)</li> </ul>
<b>16.EA.14</b>	apply their understanding of the meaning and order of operations when	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Explore the use of brackets and order of operations to write number sentences</li> </ul>	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Extend and apply the laws and properties of arithmetic to algebraic terms and</li> </ul>	<ul style="list-style-type: none"> <li>Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)</li> </ul>

	carrying out more complicated calculations	(ACMNA134)	expressions (ACMNA177)	
<b>16.EA.15</b>	use mental, written and electronic methods to carry out computations involving addition and subtraction of fractions where a common denominator is readily identifiable, and multiplication and simple division of fractions	<b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Solve problems involving addition and subtraction of fractions with the same or related denominators (ACMNA126)</li> <li>Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies (ACMNA127)</li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Solve problems involving addition and subtraction of fractions (including those with unrelated denominators) (ACMNA153)</li> <li>Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)</li> </ul>	
<b>16.EA.16</b>	interpret and solve practical problems, using an appropriate sequence of operations and suitable methods when dealing with integers, decimals, simple percentages, proportions, ratios and rates including money, time and other measurements	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)</li> </ul> <b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers (ACMNA128)</li> <li>Multiply decimals by whole numbers and perform divisions that result in terminating</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)</li> </ul> <b>Real numbers</b> <ul style="list-style-type: none"> <li>Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)</li> <li>Express one quantity as a fraction of another with and without the use of digital technologies (ACMNA155)</li> <li>Connect fractions, decimals and percentages and carry out simple conversions</li> </ul>	<b>Number and place value</b> <ul style="list-style-type: none"> <li>Carry out the four operations with integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)</li> </ul> <b>Real numbers</b> <ul style="list-style-type: none"> <li>Solve problems involving use of percentages, including percentage increase and decrease, with and without digital technologies (ACMNA187)</li> <li>Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)</li> </ul> <b>Money and financial</b>

		<p>decimals , with and without digital technologies (ACMNA129)</p> <ul style="list-style-type: none"> <li>• Multiply and divide decimals by powers of 10 (ACMNA130)</li> </ul> <p><b>Money and financial mathematics</b></p> <ul style="list-style-type: none"> <li>• Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies (ACMNA132)</li> </ul>	<p>(ACMNA157)</p> <ul style="list-style-type: none"> <li>• Find percentages of quantities and express one quantity as a percentage of another, with and without digital technologies (ACMNA158)</li> <li>• Recognise and solve problems involving simple ratios (ACMNA173)</li> </ul> <p><b>Money and financial mathematics</b></p> <ul style="list-style-type: none"> <li>• Investigate and calculate best buys, with and without digital technologies (ACMNA174)</li> </ul>	<p><b>mathematics</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving profit and loss, with and without digital technologies (ACMNA189)</li> </ul>
16.EA.17	choose and use a range of strategies to solve problems, including sensible choices about mental, written and electronic methods for calculation	<p><b>Number and place value</b></p> <ul style="list-style-type: none"> <li>• Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers (ACMNA123)</li> </ul> <p><b>Fractions and decimals</b></p> <ul style="list-style-type: none"> <li>• Multiply decimals by whole numbers and perform divisions that result in terminating decimals , with and without digital technologies (ACMNA129)</li> <li>• Multiply and divide decimals by powers of 10 (ACMNA130)</li> </ul>	<p><b>Number and place value</b></p> <ul style="list-style-type: none"> <li>• Apply the associative, commutative and distributive laws to aid mental and written computation (ACMNA151)</li> </ul> <p><b>Real numbers</b></p> <ul style="list-style-type: none"> <li>• Round decimals to a specified number of decimal places (ACMNA156)</li> </ul>	<p><b>Number and place value</b></p> <ul style="list-style-type: none"> <li>• Carry out the four operations with integers, using efficient mental and written strategies and appropriate digital technologies (ACMNA183)</li> </ul>

<b>16.EA.18</b>	make estimates for calculations using their knowledge of number systems and relationships, mental calculation, rounding and magnitude based on powers of 10	<b>Fractions and decimals</b> <ul style="list-style-type: none"> <li>Add and subtract decimals, with and without digital technologies, and (use estimation and rounding to check the reasonableness of answers) <a href="#">(ACMNA128)</a></li> </ul>	<b>Real numbers</b> <ul style="list-style-type: none"> <li>Round decimals to a specified number of decimal places <a href="#">(ACMNA156)</a></li> </ul>	
Estimation should be used for many calculations within this band of development				

Every chance to learn		Australian Curriculum		
17. The student chooses and uses measures		Statistics and probability Space and Geometry		
		Year 6	Year 7	Year 8
<b>17.EA.1</b>	metric measurement units and International System (SI) units and the relationships between units (e.g. length in metres, centimetres and millimetres; area in square metres and square centimetres; volume in cubic metres and cubic centimetres; capacity in litres and millilitres; and mass in kilograms and grams)	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Connect decimal representations to the metric system (ACMMG135)</li> <li>Convert between common metric units of length, mass and capacity (ACMMG136)</li> </ul>		<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)</li> </ul>
<b>17.EA.2</b>	imperial and metric systems used in Australia and other countries (e.g. origins of the different systems and reasons for change of system in Australia)	Not addressed in Australian Curriculum, but is useful for proportion understanding and creating Global awareness		
<b>17.EA.3</b>	measurement error and ranges of values	Not addressed in Australian Curriculum		

	for given measurements relating to the context for measuring			
<b>17.EA.4</b>	formulas to calculate quantities that cannot be measured directly or to measure more efficiently, including making judgements about the reasonableness of results		<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Establish formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (ACMMG159)</li> <li>Calculate volumes of rectangular prisms (ACMMG160)</li> </ul>	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Find perimeters and areas of parallelograms, rhombuses and kites (ACMMG196)</li> <li>Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)</li> <li>Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (ACMMG198)</li> </ul>
<b>17.EA.5</b>	the probability of events in familiar situations	<b>Chance</b> <ul style="list-style-type: none"> <li>Describe probabilities using fractions, decimals and percentages (ACMSP144)</li> </ul>	<b>Chance</b> <ul style="list-style-type: none"> <li>Construct sample spaces for single-step experiments with equally likely outcomes (ACMSP167)</li> <li>Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)</li> </ul>	<b>Chance</b> <ul style="list-style-type: none"> <li>Identify complementary events and use the sum of the probabilities to solve problems (ACMSP204)</li> </ul>
<b>17.EA.6</b>	discrete and continuous data, and summary statistics to		<b>Data representation and interpretation</b>	<b>Data representation and interpretation</b>

	describe the distribution of data, including frequency, relative frequency, mean, median and mode		<ul style="list-style-type: none"> <li>Identify and investigate issues involving continuous or large count data collected from primary and secondary sources (ACMSP169)</li> <li>Calculate mean, median and range for sets of data. Interpret these statistics in the context of data (ACMSP171)</li> <li>Describe and interpret data displays and the relationship between the median and mean (ACMSP172)</li> </ul>	<ul style="list-style-type: none"> <li>Explore the variations of mean and proportions in representative data (ACMSP293)</li> </ul>
<b>17.EA.7</b>	ways in which statistics and probability are used in society (e.g. to inform decision-making, in medicine and in meteorology)	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Interpret secondary data presented in digital media and elsewhere (ACMSP148)</li> </ul>	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Identify and investigate issues involving continuous or large count data collected from primary and secondary sources (ACMSP169)</li> </ul>	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Explore the practicalities and implications of obtaining representative data using a variety of investigative processes (ACMSP206)</li> </ul>
<b>17.EA.8</b>	choose and use standard units to measure and compare the magnitudes of lengths, areas, volumes, masses, angles, times (including those on 24-hour clocks, schedules, timelines, time elapsed) and temperatures, as applicable to various	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)</li> <li>Interpret and use timetables (ACMMG139)</li> </ul>		<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)</li> <li>Solve problems involving duration, including using 12- and 24-hour time within a single time zone (ACMMG199)</li> </ul>

	objects and events			
<b>17.EA.9</b>	select appropriate instruments and other technology when measuring, including those involving scales where not all of the graduations are numbered	Not addressed in Australian Curriculum however is considered an aspect of pedagogy for teaching measurement		
<b>17.EA.10</b>	estimate quantities with respect to common everyday measures within a given range	Not addressed in Australian Curriculum however is considered an aspect of pedagogy for teaching measurement		
<b>17.EA.11</b>	develop and use simple formulas to calculate perimeter, area, surface area and volume of common regular shapes from the relevant measured linear dimensions, and apply these to practical problems	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Solve problems involving the comparison of lengths and areas using appropriate units (<a href="#">ACMMG137</a>)</li> <li>Connect volume and capacity and their units of measurement (<a href="#">ACMMG138</a>)</li> </ul>	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Establish formulas for areas of rectangles, triangles and parallelograms and use these in problem solving (<a href="#">ACMMG159</a>)</li> <li>Calculate volumes of rectangular prisms (<a href="#">ACMMG160</a>)</li> </ul>	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Find perimeters and areas of parallelograms, rhombuses and kites (<a href="#">ACMMG196</a>)</li> <li>Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (<a href="#">ACMMG197</a>)</li> <li>Develop the formulas for volumes of rectangular and triangular prisms and prisms in general. Use formulas to solve problems involving volume (<a href="#">ACMMG198</a>)</li> </ul>

<p><b>17.EA.12</b></p>	<p>calculate times that involve 12-hour and 24-hour time cycles, duration of events and schedules in practical situations, and take into account time zones</p>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li>• Interpret and use timetables (ACMMG139)</li> </ul>		<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving duration, including 12- and 24-hour time within a single time zone (ACMMG199)</li> </ul>
<p><b>17.EA.13</b></p>	<p>make and interpret empirical estimates of probabilities related to familiar events with different likelihoods of occurrence, compare experimental data for simple chance events with theoretical probability expressed as percentages, fractions or decimals between zero and one, and distinguish events that are equally likely from those that are not</p>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li>• Describe probabilities using fractions, decimals and percentages (ACMSP144)</li> <li>• Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies (ACMSP145)</li> <li>• Compare observed frequencies across experiments with predicted frequencies (ACMSP146)</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li>• Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li>• Identify complementary events and use the sum of the probabilities to solve problems (ACMSP204)</li> </ul>
<p><b>17.EA.14</b></p>	<p>identify data as discrete or continuous and use technology to create a variety of representations, including two-way tables, to summarise sample data obtained from a given</p>	<p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li>• Interpret and compare a range of data displays, including segmented bar charts and side-by-side column graphs for two-categorical variables (ACMSP147)</li> </ul>		<p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li>• Explore the practicalities and implications of obtaining representative data using a variety of investigative processes (ACMSP206)</li> </ul>

	population			
<b>17.EA.15</b>	analyse and comment on data related to a particular situation, issue or topic of interest, identify and interpret variation in data, calculate and compare the range and measures of location (mean, median, mode), make informal inferences and note possible causes of bias	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Interpret secondary data presented in digital media and elsewhere (<a href="#">ACMSP148</a>)</li> </ul>	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Calculate mean, median, mode and range for sets of data. Interpret these statistics in the context of data (<a href="#">ACMSP171</a>)</li> <li>Describe and interpret data displays and the relationship between median and mean (<a href="#">ACMSP172</a>)</li> </ul>	<b>Data representation and interpretation</b> <ul style="list-style-type: none"> <li>Explore the practicalities and implications of obtaining representative data using a variety of investigative processes (<a href="#">ACMSP206</a>)</li> <li>Explore the variations of mean and proportions in representative data (<a href="#">ACMSP293</a>)</li> <li>Investigate the effect of individual data values, including outliers, on the mean and median (<a href="#">ACMSP207</a>)</li> </ul>

Every chance to learn		Australian Curriculum		
18. The student recognises and represents patterns and relationships		Number and algebra Space and Geometry		
		Year 6	Year 7	Year 8
<b>18.EA.1</b>	properties involving line, length, angle and surface of common 2D shapes (square, rectangle, triangle, parallelogram, trapezium, pentagon, hexagon, octagon, circle), 3D objects (prism, pyramid, sphere, cylinder) and part and composite shapes	<b>Geometric reasoning</b> <ul style="list-style-type: none"> <li>Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles (ACMMG141)</li> </ul>	<b>Geometric reasoning</b> <ul style="list-style-type: none"> <li>Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165)</li> <li>Demonstrate that the angle sum of a triangle is <math>180^\circ</math> and use this to find the angle sum of a quadrilateral (ACMMG166)</li> </ul>	<b>Using units of measurement</b> <ul style="list-style-type: none"> <li>Choose appropriate units of measurement for area and volume and convert from one unit to another (ACMMG195)</li> <li>Investigate the relationship between features of circles such as circumference, area, radius and diameter. Use formulas to solve problems involving circumference and area (ACMMG197)</li> </ul> <b>Geometric reasoning</b> <ul style="list-style-type: none"> <li>Establish properties of quadrilaterals using congruent triangles and angle properties and solve related numerical problems using reasoning (ACMMG202)</li> </ul>
<b>18.EA.2</b>	the congruence of shapes (e.g. where one shape can be superimposed on another through a sequence of	<b>Location and transformation</b> <ul style="list-style-type: none"> <li>Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies</li> </ul>		<b>Geometric reasoning</b> <ul style="list-style-type: none"> <li>Define congruence of plane shapes using transformations (ACMMG200)</li> <li>Develop the conditions for</li> </ul>

	transformations—reflections, rotations, translations) and the similarity of shapes (e.g. where one shape is an enlargement or reduction of another)	(ACMMG142)		congruence of triangles (ACMMG201)
18.EA.3	points, lines and planes of symmetry in shapes and objects and relationship of these to transformations and tessellations of suitable shapes in the plane (e.g. a spider web has a central point of rotation and symmetry by rotation through an angle of 72 degrees about this point)	<b>Location and transformation</b> <ul style="list-style-type: none"> <li>Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142)</li> </ul>	<b>Location and transformation</b> <ul style="list-style-type: none"> <li>Describe translations, reflections in an axis, and rotations of multiples of <math>90^\circ</math> (on the Cartesian plane using coordinates). Identify line and rotational symmetries (ACMMG181)</li> </ul>	
18.EA.4	the concept of variables in relationships		<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)</li> </ul>	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)</li> <li>Factorise algebraic expressions by identifying numerical factors (ACMNA191)</li> <li>Simplify algebraic expressions involving the four operations</li> </ul>

				(ACMNA192)
<b>18.EA.5</b>	mathematical representations of relationships (e.g. expressions, formulas and equations)		<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>• Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)</li> <li>• Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul> <p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>• Given coordinates, plot points on the Cartesian plane and find coordinates for a given point (ACMNA178)</li> <li>• Solve simple linear equations (ACMNA179)</li> </ul>	<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>• Extend and apply the distributive law to the expansion of algebraic expressions (ACMNA190)</li> <li>• Factorise algebraic expressions by identifying numerical factors (ACMNA191)</li> <li>• Simplify algebraic expressions involving the four operations (ACMNA192)</li> </ul>
<b>18.EA.6</b>	linear and other simple algebraic equations that involve the operations of addition, subtraction and multiplication		<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>• Given coordinates, plot points on the Cartesian plane and find coordinates for a given point (ACMNA178)</li> <li>• Solve simple linear equations (ACMNA179)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>• Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)</li> <li>• Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)</li> </ul>
<b>18.EA.7</b>	symbols used to represent variables and operations in algebraic		<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>• Create algebraic expressions and evaluate them by</li> </ul>	<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>• Extend and apply the distributive law to the</li> </ul>

	expressions and formulas		<p>substituting a given value for each variable (ACMNA176)</p> <ul style="list-style-type: none"> <li>Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul> <p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Solve simple linear equations (ACMNA179)</li> </ul>	<p>expansion of algebraic expressions (ACMNA190)</p> <ul style="list-style-type: none"> <li>Factorise algebraic expressions by identifying numerical factors (ACMNA191)</li> <li>Simplify algebraic expressions involving the four operations (ACMNA192)</li> </ul>
<b>18.EA.8</b>	functions defined by simple rules, using whole number values as inputs		<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>Introduce the concept of variables as a way of representing numbers using letters (ACMNA175)</li> <li>Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)</li> <li>Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)</li> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (ACMNA194)</li> </ul>
<b>18.EA.9</b>	purposes and conventions of different representations (e.g. grids and simple coordinate systems, maps, plans, diagrams, graphs, models, flow charts, networks and	<p><b>Location and transformation</b></p> <ul style="list-style-type: none"> <li>Introduce the Cartesian coordinate system using all four quadrants (ACMMG143)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Given coordinates, plot points on the Cartesian plane and find coordinates for a given point (ACMNA178)</li> <li>Investigate, interpret and analyse graphs from authentic data (ACMNA180)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Plot linear relationships on the Cartesian plane with and without the use of digital technologies (ACMNA193)</li> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by</li> </ul>

	timelines)			substitution ( <a href="#">ACMNA194</a> )
<b>18.EA.10</b>	major and intermediate compass points, the corresponding degrees of turn, and straightforward scales, distance and annotations (e.g. arrows) used in maps and plans to specify location	Not specifically addressed in Australian Curriculum		
<b>18.EA.11</b>	mathematical and scientific symbols and conventions used in diagrams, tables and graphs representing concepts and relationships			<b>Linear and non-linear relationships</b> <ul style="list-style-type: none"> <li>Plot linear relationships on the Cartesian plane with and without the use of digital technologies (<a href="#">ACMNA193</a>)</li> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (<a href="#">ACMNA194</a>)</li> </ul>
<b>18.EA.12</b>	the evolution of representations in mathematics over time and common variations in their use	Not addressed in Australian Curriculum		
<b>18.EA.13</b>	analyse a range of patterns, generalise and apply rules, predict elements or create new variations of patterns	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to generate the sequence</li> </ul>	<b>Patterns and algebra</b> <ul style="list-style-type: none"> <li>Introduce the concept of variables as a way of representing numbers using letters (<a href="#">ACMNA175</a>)</li> </ul>	

		(ACMNA133)	<ul style="list-style-type: none"> <li>• Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)</li> <li>• Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul>	
<b>18.EA.14</b>	sketch representations of common 2D shapes and 3D objects from different viewpoints, with attention to their geometric properties		<b>Shape</b> <ul style="list-style-type: none"> <li>• Draw different views of prisms and solids formed from combinations of prisms (ACMMG161)</li> </ul>	
<b>18.EA.15</b>	construct accurate representations of 2D shapes according to specification (e.g. using drawing instruments and software) and 3D objects from plans, nets and isometric diagrams	<b>Shape</b> <ul style="list-style-type: none"> <li>• Construct simple prisms and pyramids (ACMMG140)</li> </ul>		
<b>18.EA.16</b>	solve problems requiring knowledge of geometric properties and transformations of common 2D shapes and 3D objects	<b>Location and transformation</b> <ul style="list-style-type: none"> <li>• Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies (ACMMG142)</li> </ul>	<b>Location and transformation</b> <ul style="list-style-type: none"> <li>• Describe translations, reflections in an axis and rotations of multiples of 90° (on the Cartesian plane using coordinates). Identify line and rotational symmetries (ACMMG181)</li> </ul>	<b>Geometric reasoning</b> <ul style="list-style-type: none"> <li>• Define congruence of plane shapes using transformations (ACMMG200)</li> <li>• Establish properties of quadrilaterals using congruent triangles and angle properties and solve related numerical problems using reasoning</li> </ul>

				(ACMMG202)
<b>18.EA.17</b>	read, interpret and use representations of practical situations (e.g. simple formulas), describe them using suitable materials and diagrams and evaluate expressions for whole number and simple fraction values		<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>• Create algebraic expressions and evaluate them by substituting a given value for each variable (ACMNA176)</li> <li>• Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (ACMNA177)</li> </ul> <p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>• Solve simple linear equations (ACMNA179)</li> </ul>	
<b>18.EA.18</b>	use a variety of approaches, including words, diagrams, materials and symbols, to represent variables and to represent, manipulate and rearrange simple algebraic expressions that involve the operations of addition, subtraction, multiplication and division; establish equivalences and determine when they are satisfied or not for a given set of	Not specifically addressed in Australian Curriculum, however does feature in elaborations		

	values			
<b>18.EA.19</b>	solve linear and other simple algebraic equations using a variety of approaches and explain their reasoning (e.g. using materials, flow charts, tables, graphs, inverse operations and algebra)		<p><b>Patterns and algebra</b></p> <ul style="list-style-type: none"> <li>Extend and apply the laws and properties of arithmetic to algebraic terms and expressions (<a href="#">ACMNA177</a>)</li> </ul> <p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Solve simple linear equations (<a href="#">ACMNA179</a>)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Plot linear relationships on the Cartesian plane with and without the use of digital technologies (<a href="#">ACMNA193</a>)</li> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (<a href="#">ACMNA194</a>)</li> </ul>
<b>18.EA.20</b>	construct tables of values for functions defined by simple rules, using whole number values as inputs and plotting the corresponding set of ordered pairs (e.g. using ICT), and interpret simple functions, the set of input values used and the set of output values obtained in context		<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Given coordinates, plot points on the Cartesian plane and find coordinates for a given point (<a href="#">ACMNA178</a>)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Plot linear relationships on the Cartesian plane with and without the use of digital technologies (<a href="#">ACMNA193</a>)</li> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (<a href="#">ACMNA194</a>)</li> </ul>
<b>18.EA.21</b>	interpret, make and use a range of representations (e.g. words, mathematical symbols and conventions, diagrams, tables,		<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Given coordinates, plot points on the Cartesian plane and find coordinates for a given point (<a href="#">ACMNA178</a>)</li> </ul>	<p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li>Solve linear equations using algebraic and graphical techniques. Verify solutions by substitution (<a href="#">ACMNA194</a>)</li> </ul>

	graphs, maps, plans, models, flow charts, networks, timelines) to develop suitable representations of concepts and relationships, including the use of ICT (e.g. choose and create graphs to represent data entered on a spreadsheet)		<ul style="list-style-type: none"> <li>Investigate, interpret and analyse graphs from authentic data (<a href="#">ACMNA180</a>)</li> </ul>	
<b>18.EA.22</b>	provide and follow instructions for moving from one location to another based on maps or plans and use the scale to estimate or calculate distances between locations	Not addressed at this year level in Australian Curriculum – features in year 5 content		

**Australian curriculum content not previously required at this band of development in *Every chance to learn*:**

**Year 6**

None

**Year 7**

- Identify corresponding, alternate and co-interior angles when two parallel straight lines are crossed by a transversal (addressed in Later Adolescent band of development in ECTL 18.LA.2) ([ACMMG163](#))
- Investigate conditions for two lines to be parallel and solve simple numerical problems, using reasoning (addressed in Later Adolescent band of development in ECTL 18.LA.2) ([ACMMG164](#))
- Investigate and use square roots of perfect squares ([ACMNA150](#))
- Solve problems involving addition and subtraction of fractions (including those with unrelated denominators) ([ACMNA153](#))

- Construct and compare a range of data displays including stem and leaf plots and dot plots (more specific than in Every chance to learn) ([ACMSP170](#))
- Demonstrate that the angle sum of a triangle is  $180^\circ$  and use this to find the angle sum of a quadrilateral (has a link with 18.LA.2 as well) ([ACMMG166](#))

### **Year 8**

- Use index notation with numbers to establish the index laws with positive integral indices and the zero index ([ACMNA182](#))
- Investigate the concept of irrational numbers, including  $\pi$  ([ACMNA186](#))
- 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](#))
- Represent such events in two-way tables and Venn diagrams and solve related problems (both refer to statistical literacy and are more specific than in ECTL) ([ACMSP292](#))