

## AusVELS Mathematics Level 4




**Understanding** includes making connections between representations of numbers, partitioning and combining numbers flexibly, extending place value to decimals, using appropriate language to communicate times, using informal units for comparing, 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 and 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

\*This document intends to assist teachers in their implementation of the Australian curriculum through AUSVELS– it combines description and elaboration statements. The blue elaborations are examples of how the learning can be achieved; not a list of tasks that have to be done. Teachers are advised to consult the online documentation to clarify further detail for themselves. The ‘AusVELS’ is the official documentation for Victorian schools.

Number & Algebra:	Measurement & Geometry:	Statistics & Probability:
<p><b>Number &amp; place value:</b> Investigate and use the properties of odd and even numbers (ACMNA071)</p> <ul style="list-style-type: none"> <li>using the four operations with pairs of odd or even numbers or one odd and one even number, then using the relationships established to check the accuracy of calculations</li> </ul> <p>Recognise, represent and order numbers to at least tens of thousands (ACMNA072)</p> <ul style="list-style-type: none"> <li>reproducing five-digit numbers in words using their numerical representations, and vice versa</li> </ul> <p>Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA073)</p> <ul style="list-style-type: none"> <li>recognising and demonstrating that the place-value pattern is built on the operations of multiplication or division of tens</li> </ul> <p>Investigate number sequences involving multiples of 3, 4, 6, 7, 8, and 9 (ACMNA074)</p> <ul style="list-style-type: none"> <li>recognising that number sequences can be extended indefinitely, and determining any patterns in the sequences</li> </ul> <p>Recall multiplication facts up to <math>10 \times 10</math> and related division facts (ACMNA075)</p> <ul style="list-style-type: none"> <li>using known multiplication facts to calculate related division facts</li> </ul> <p>Develop efficient mental and written strategies and use appropriate digital technologies for multiplication and for division where there is no remainder (ACMNA076)</p> <ul style="list-style-type: none"> <li>using known facts and strategies, such as commutativity, doubling and halving for multiplication, and connecting division to multiplication when there is no remainder</li> </ul> <p><b>Fraction &amp; Decimals:</b> Investigate equivalent fractions used in contexts (ACMNA077) exploring the relationship between families of fractions (halves, quarters and eighths or thirds and sixths) by folding a series of paper strips to construct a fraction wall</p> <p>Count by quarters halves and thirds, including with mixed numerals. Locate and represent these fractions on a numberline (ACMNA078) </p> <ul style="list-style-type: none"> <li>converting mixed numbers to improper fractions and vice versa</li> <li>investigating the use of fractions and sharing as a way of managing Country: for example taking no more than half the eggs from a nest to protect future bird populations</li> </ul> <p>Recognise that the place value system can be extended to tenths and hundredths. Make connections between fractions and decimal notation (ACMNA079)</p> <ul style="list-style-type: none"> <li>using division by 10 to extend the place-value system</li> <li>using knowledge of fractions to establish equivalences between fractions and decimal notation</li> </ul>	<p><b>Using units of measurement:</b> Use scaled instruments to measure and compare lengths, masses, capacities and temperatures (ACMMG084)</p> <ul style="list-style-type: none"> <li>reading and interpreting the graduated scales on a range of measuring instruments to the nearest graduation</li> </ul> <p>Compare objects using familiar metric units of area and volume (ACMMG290)</p> <ul style="list-style-type: none"> <li>comparing areas using grid paper</li> <li>comparing volume using centicubes</li> </ul> <p>Convert between units of time (ACMMG085)</p> <ul style="list-style-type: none"> <li>identifying and using the correct operation for converting units of time</li> </ul> <p>Use am and pm notation and solve simple time problems (ACMMG086)</p> <ul style="list-style-type: none"> <li>calculating the time spent at school during a normal school day</li> <li>calculating the time required to travel between two locations</li> <li>determining arrival time given departure time</li> </ul> <p><b>Shape:</b> Compare the areas of regular and irregular shapes by informal means (ACMMG087)</p> <ul style="list-style-type: none"> <li>comparing areas using metric units, such as counting the number of square centimetres required to cover two areas by overlaying the areas with a grid of centimetre squares</li> </ul> <p>Compare and describe two dimensional shapes that result from combining and splitting common shapes, with and without the use of digital technologies (ACMMG088)</p> <ul style="list-style-type: none"> <li>identifying common two-dimensional shapes that are part of a composite shape by recreating it from these shapes</li> <li>creating a two-dimensional shapes from verbal or written instructions</li> </ul> <p><b>Location &amp; transformation:</b> Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090) </p> <ul style="list-style-type: none"> <li>identifying the scale used on maps of cities and rural areas in Australia and a city in Indonesia and describing the difference</li> <li>using directions to find features on a map</li> </ul> <p>Create symmetrical patterns, pictures and shapes with and without digital technologies (ACMMG091) </p> <ul style="list-style-type: none"> <li>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</li> </ul>	<p><b>Chance:</b> Describe possible everyday events and order their chances of occurring (ACMSP092)</p> <ul style="list-style-type: none"> <li>using lists of events familiar to students and ordering them from 'least likely' to 'most likely' to occur</li> </ul> <p>Identify everyday events where one cannot happen if the other happens (ACMSP093)</p> <ul style="list-style-type: none"> <li>using examples such as weather, which cannot be dry and wet at the same time</li> </ul> <p>Identify events where the chance of one will not be affected by the occurrence of the other (ACMSP094)</p> <ul style="list-style-type: none"> <li>explaining why the probability of a new baby being either a boy or a girl does not depend on the sex of the previous baby</li> </ul> <p><b>Data representation &amp; interpretation:</b> Select and trial methods for data collection, including survey questions and recording sheets (ACMSP095)</p> <ul style="list-style-type: none"> <li>comparing the effectiveness of different methods of collecting data</li> <li>choosing the most effective way to collect data for a given investigation</li> </ul> <p>Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096)</p> <ul style="list-style-type: none"> <li>exploring ways of presenting data and showing the results of investigations</li> <li>investigating data displays using many-to-one correspondence</li> </ul> <p>Evaluate the effectiveness of different displays in illustrating data features including variability (ACMSP097)</p> <ul style="list-style-type: none"> <li>interpreting data representations in the media and other forums in which symbols represent more than one data value</li> <li>suggesting questions that can be answered by a given data display and using the display to answer questions</li> </ul>

<p><b>Money &amp; Financial mathematics:</b> Solve problems involving purchases and the calculation of change to the nearest five cents with and without digital technologies (ACMNA080)</p> <ul style="list-style-type: none"> <li>recognising that not all countries use dollars and cents, eg. India uses rupees.</li> <li>Carrying out calculations in another currency as well as in dollars and cents, and identifying both as decimal systems</li> </ul> <p><b>Patterns &amp; algebra:</b> Explore and describe number patterns resulting from performing multiplication (ACMNA081)</p> <ul style="list-style-type: none"> <li>identifying examples of number patterns in everyday life</li> </ul> <p>Solve word problems by using number sentences involving multiplication or division where there is no remainder (ACMNA082)</p> <ul style="list-style-type: none"> <li>representing a word problem as a number sentence</li> <li>writing a word problem using a given number sentence</li> </ul> <p>Use equivalent number sentences involving addition and subtraction to find unknown quantities (ACMNA083)</p> <ul style="list-style-type: none"> <li>writing number sentences to represent and answer questions such as: 'When a number is added to 23 the answer is the same as 57 minus 19. What is the number?'</li> <li>using partitioning to find unknown quantities in number sentences</li> </ul>	<p><b>Geometric Reasoning:</b> Compare angles and classify them as equal to, greater than or less than a right angle (ACMMG089)</p> <ul style="list-style-type: none"> <li>creating angles and comparing them to a right angle using digital technologies</li> </ul>	
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**Level 4 achievement standard**

**Number and Algebra**  
Students recall multiplication facts to 10 x 10 and related division facts. They choose appropriate strategies for calculations involving multiplication and division, with and without the use of digital technology, and estimate answers accurately enough for the context. Students solve simple purchasing problems with and without the use of digital technology. They locate familiar fractions on a number line, recognise common equivalent fractions in familiar contexts and make connections between fractions and decimal notations up to two decimal places. Students identify unknown quantities in number sentences. They use the properties of odd and even numbers and describe number patterns resulting from multiplication. Students continue number sequences involving multiples of single digit numbers and unit fractions, and locate them on a number line.

**Measurement and Geometry**  
Students compare areas of regular and irregular shapes, using informal units. They solve problems involving time duration. Students use scaled instruments to measure length, angle, area, mass, capacity and temperature of shapes and objects. They convert between units of time. Students create symmetrical simple and composite shapes and patterns, with and without the use of digital technology. They classify angles in relation to a right angle. Students interpret information contained in maps.

**Statistics and Probability**  
Students describe different methods for data collection and representation, and evaluate their effectiveness. They construct data displays from given or collected data, with and without the use of digital technology. Students list the probabilities of everyday events. They identify dependent and independent events.

Cross-curriculum priorities to be included in all learning areas:  
 Aboriginal and Torres Strait Islander histories and cultures (👉);  
 Asia and Australia's engagement with Australia (🌏);  
 Sustainability (🌱)

Reference : <http://ausvels.vcaa.vic.edu.au/> This grid is an adaption of the information from the VCAA site to create a visual representation to assist teachers.