

Number & Algebra:	Measurement & Geometry:	Statistics & Probability:
<p><b>Number &amp; place value:</b></p> <p>Identify and describe factors and multiples of whole numbers and use them to solve problems (VCMNA181)</p> <ul style="list-style-type: none"> <li>exploring factors and multiples using number sequences</li> <li>using simple divisibility tests</li> </ul> <p>Use estimation and rounding to check the reasonableness of answers to calculations (VCMNA182)</p> <ul style="list-style-type: none"> <li>recognising the usefulness of estimation to check calculations</li> <li>applying mental strategies to estimate the result of calculations, such as estimating the cost of a supermarket trolley load</li> </ul> <p>Solve problems involving multiplication of large numbers by one or two digit numbers using efficient mental, written strategies and appropriate digital technologies (VCMNA183)</p> <ul style="list-style-type: none"> <li>using rounding and making estimates for computations</li> <li>exploring techniques for multiplication such as the area model, the Italian lattice method or the partitioning of numbers</li> <li>applying the distributive law and using arrays to model multiplication and explain calculation strategies</li> </ul> <p>Solve problems involving division by a one digit number, including those that result in a remainder (VCMNA184)</p> <ul style="list-style-type: none"> <li>using the fact that equivalent division calculations result if both numbers are divided by the same factor</li> <li>using rounding and making estimates for computations</li> <li>interpreting and representing the remainder in division calculations sensibly for the context</li> </ul> <p>Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (VCMNA185)</p> <ul style="list-style-type: none"> <li>choosing between mental, written and a technology based computation depending on the nature of the problems and the purpose for computation</li> <li>using technology to solve problems and check the reasonableness of answers</li> </ul> <p>Recognise, represent and order numbers to at least hundreds of thousands (VCMNA186)</p> <ul style="list-style-type: none"> <li>reproducing six-digit numbers in words using their numerical representations and vice versa</li> </ul> <p><b>Fractions &amp; Decimals:</b></p> <p>Compare and order common unit fractions and locate and represent them on a number line (VCMNA187)</p> <ul style="list-style-type: none"> <li>recognising the connection between the order of unit fractions and their denominators</li> </ul> <p>Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator (VCMNA188)</p> <ul style="list-style-type: none"> <li>modelling and solving addition and subtraction problems involving fractions by using jumps on a number line, or making diagrams of fractions as parts of shapes</li> </ul> <p>Recognise that the place value system can be extended beyond hundredths (VCMNA189)</p> <ul style="list-style-type: none"> <li>using knowledge of place value and division by 10 to extend the number system to thousandths and beyond</li> <li>recognising the equivalence of thousandths and 0.001</li> </ul> <p>Compare, order and represent decimals (VCMNA190)</p> <ul style="list-style-type: none"> <li>locating decimals on a number line</li> </ul>	<p><b>Using units of measurement:</b></p> <p>Choose appropriate units of measurement for length, area, volume, capacity and mass (VCMMG195)</p> <ul style="list-style-type: none"> <li>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</li> <li>recognising that some units of measurement are better suited for some tasks than others, for example kilometres rather than metres to measure the distance between two towns</li> </ul> <p>Calculate the perimeter and area of rectangles and the volume and capacity of prisms using familiar metric units (VCMMG196)</p> <ul style="list-style-type: none"> <li>exploring efficient ways of calculating the perimeters of rectangles such as adding the length and width together and doubling the result</li> <li>exploring efficient ways of finding the areas of rectangles,</li> <li>measuring volume and capacity by counting the number of cubes (cubic centimetres)</li> <li>exploring efficient ways of finding the volume and capacity of rectangular prisms and cubes</li> </ul> <p>Compare 12 and 24 hour time systems and convert between them (VCMMG197)</p> <ul style="list-style-type: none"> <li>investigating the ways time was and is measured in different Aboriginal Country, such as using tidal change</li> <li>using units hours, minutes and seconds</li> </ul> <p><b>Shape:</b></p> <p>Connect three-dimensional objects with their nets and other two-dimensional representations (VCMMG198)</p> <ul style="list-style-type: none"> <li>identifying the shape and relative position of each face of a solid to determine the net of the solid, including that of prisms and pyramids</li> <li>representing two-dimensional shapes such as photographs, sketches and images created by digital technologies</li> </ul> <p><b>Location &amp; transformation:</b></p> <p>Use a grid reference system to describe locations. Describe routes using landmarks and directional language (VCMMG199)</p> <ul style="list-style-type: none"> <li>comparing aerial views of Country, desert paintings and maps with grid references</li> <li>creating a grid reference system for the classroom and using it to locate objects and describe routes from one object to another</li> </ul> <p>Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries (VCMMG200)</p> <ul style="list-style-type: none"> <li>identifying and describing the line and rotational symmetry of a range of two-dimensional shapes, by manually cutting, folding and turning shapes and by using digital technologies</li> <li>identifying the effects of transformations by manually flipping, sliding and turning two-dimensional shapes and by using digital technologies</li> </ul> <p>Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original (VCMMG201)</p>	<p><b>Chance:</b></p> <p>List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions (VCMSP203)</p> <ul style="list-style-type: none"> <li>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)</li> </ul> <p>Recognise that probabilities range from 0 to 1 (VCMSP204)</p> <ul style="list-style-type: none"> <li>investigating the probabilities of all outcomes for a simple chance experiment and verifying that their sum equals 1</li> </ul> <p><b>Data representation &amp; interpretation:</b></p> <p>Pose questions and collect categorical or numerical data by observation or survey (VCMSP205)</p> <ul style="list-style-type: none"> <li>posing questions about insect diversity in the playground, collecting data by taping a one-metre-square piece of paper to the playground and observing the type and number of insects on it over time</li> </ul> <p>Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (VCMSP206)</p> <ul style="list-style-type: none"> <li>identifying the best methods of presenting data to illustrate the results of investigations and justifying the choice of representations</li> </ul> <p>Describe and interpret different data sets in context (VCMSP207)</p> <ul style="list-style-type: none"> <li>using and comparing data representations for different data sets to help decision making</li> </ul>

## Money & Financial mathematics:

Create simple financial plans (VCMNA191)

- creating a simple budget for a class fundraising event
- identifying the GST component of invoices and receipts

## Patterns & algebra:

Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction (VCMNA192)

- using the number line or diagrams to create patterns involving fractions or decimals

Use equivalent number sentences involving multiplication and division to find unknown quantities (VCMNA193)

- using relevant problems to develop number sentences

Follow a mathematical algorithm involving branching and repetition. (VCMNA194)

- simulating a simple random walk
- manipulating sets of numbers using a given rule, for example, if a number is even halve it; if a number is odd, subtract 1 then halve it

- using digital technologies to enlarge shapes
- using a grid system to enlarge a favourite image or cartoon

## Geometric reasoning:

Estimate, measure and compare angles using degrees. Construct angles using a protractor (VCMMG202)

- measuring and constructing angles using both 180° and 360° protractors
- recognising that angles have arms and a vertex; and that size is the amount of turn required for one arm to coincide with the other

## Level 5 Achievement Standard

### Number and Algebra

Students solve simple problems involving the four operations using a range of strategies including digital technology. They estimate to check the reasonableness of answers and approximate answers by rounding. Students identify and describe factors and multiples. They explain plans for simple budgets. Students order decimals and unit fractions and locate them on a number line. Students add and subtract fractions with the same denominator. They find unknown quantities in number sentences and continue patterns by adding or subtracting fractions and decimals.

### Measurement and Geometry

Students use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles and volume and capacity of rectangular prisms. They convert between 12 and 24 hour time. Students use a grid reference system to locate landmarks. They estimate angles, and use protractors and digital technology to construct and measure angles. Students connect three dimensional objects with their two dimensional representations. They describe transformations of two dimensional shapes and identify line and rotational symmetry.

### Statistics and Probability

Students pose questions to gather data and construct various displays appropriate for the data, with and without the use of digital technology. They compare and interpret different data sets.

Students list outcomes of chance experiments with equally likely outcomes and assign probabilities as a number from 0 to 1.

The proficiencies of **Understanding, Fluency, Problem Solving** and **Reasoning** are fundamental to learning mathematics and working mathematically, and are applied across all three strands Number and Algebra, Measurement and Geometry, and Statistics and Probability.

In Level 5, students **extend decimal fractions to thousandths, and explore the ideas of factors, multiples and divisibility.**

Students use **estimation and rounding for all four operations**, with and without the use of technology for calculation. They **solve multiple digit problems involving addition, subtraction, multiplication** and division by single digit divisors with remainders. Students **represent, compare and order unit fractions, and decimal fractions, and represent them on a number line.** They **construct simple budgets for familiar events and activities.** They **solve number sentences involving division**, and **create number patterns involving fractions and decimals.**

Students **choose and use suitable metric and other units for measurement of length, angle, area, volume, capacity and mass.** They calculate the perimeter and area of rectangles, and **construct specified angles using protractors and other relevant technologies.** Students use 12 and 24 hour time systems, with measurements and conversions to seconds. They use grid reference systems to describe location and connect three-dimensional objects with two-dimensional representations. They **translate, reflect and rotate shapes with and without the use of technology, and identify point and line symmetries. They explore similarity of familiar shapes through enlargement.**

**Students pose questions to collect categorical and numerical data by observation and survey, and represent the data in a variety of ways with and without the use of technology. They describe and interpret data sets in context.** Students recognise that probabilities are measured on a scale of 0 to 1 (inclusive), and **represent the probability of events from simple experiments using fractions.**