

# 'I can' statements



Foundation - Level 10

*For students, parents and teachers*

# Introduction to Black Hill's Guaranteed and Viable Maths Document

The Australian Curriculum: Mathematics is organised around the three content strands and four proficiency strands.

Content strands describe what is to be taught and learnt. They are:

- Number and Algebra
- Measurement and Geometry
- Statistics and Probability

Proficiency strands describe how content is explored or developed, that is, the thinking and doing of mathematics. They are:

- Understanding
- Fluency
- Problem Solving
- Reasoning

These ensure that each students' proficiency in mathematical skills develops throughout the curriculum and becomes increasingly sophisticated over the levels of schooling.

## Structure of a Maths session using the Proficiencies to underpin each component

Time	Who	What
5-10 min	Whole Class	<b>Fluency</b> task
5-10 min	Whole Class	Modelled or shared teaching approach to support lesson to follow
30 -40 min	Whole class, small groups or individual tasks & Teacher focus group/s	<b>Problem Solving, Understanding, Reasoning or Fluency</b> tasks to support, allow for practice or extend students
5-10 min	Learning Reflection	To show <b>Understanding</b> and <b>Reasoning</b>

# Foundation — The Big Idea is Trusting the Count, developing flexible mental objects for the numbers 0 to 20

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li>I can use materials to model problems</li> <li>I can sort objects by shape, colour and size</li> <li>I can use numbers to 20 to count forward, backwards, count on and count back to solve problems</li> <li>I can discuss the reasonableness of the answer</li> </ul>	<ul style="list-style-type: none"> <li>I can connect names, numerals and quantities to 20</li> </ul>	<ul style="list-style-type: none"> <li>I can explain comparisons of quantities</li> <li>I can create patterns</li> <li>I can explain processes for comparing length</li> </ul>	<ul style="list-style-type: none"> <li>I can count numbers in sequences to 20</li> <li>I can readily continue patterns to 20</li> <li>I can compare the lengths of objects</li> </ul>

Number and Algebra Foundation Level	Measurement and Geometry Foundation Level	Statistics and Probability Foundation Level
<p>Number and Place Value</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can count in sequences to and from 20</li> <li><input type="checkbox"/> I can start at any number and go backward and forward to 20</li> <li><input type="checkbox"/> I can match number names, numerals and quantities up to 20 including zero</li> <li><input type="checkbox"/> I can <b>Subitise</b> small groups</li> <li><input type="checkbox"/> I can compare, order and make collections to 20</li> <li><input type="checkbox"/> I can show addition and sharing to 20</li> </ul> <p>Patterns and Algebra</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can sort and classify everyday objects</li> <li><input type="checkbox"/> I can copy a pattern with objects and drawings</li> <li><input type="checkbox"/> I can continue a pattern with objects and drawings</li> <li><input type="checkbox"/> I can create a pattern with objects and drawings</li> </ul>	<p>Using units of measurement</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can decide which is longer, heavier or holds more</li> <li><input type="checkbox"/> I can use everyday language to explain what is longer, heavier or holds more</li> <li><input type="checkbox"/> I can compare and order my day and estimate how long events can take</li> <li><input type="checkbox"/> I can name the days of the week for familiar events</li> </ul> <p>Shape</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can sort, describe and name familiar two-dimensional shapes</li> <li><input type="checkbox"/> I can sort three-dimensional objects in the environment</li> </ul> <p>Location and Transformation</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use words like 'between', 'near', 'next to', 'forwards', 'towards' to describe where I am</li> </ul>	<p>Data representation and interpretation</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can answer 'yes' and 'no' questions about graphs</li> </ul>

# Year One – The Big Idea is Place Value, the importance of moving beyond counting by ones, the structure of the base 10 numeration system

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can use materials to model problems</li> <li><input type="checkbox"/> I can give and receive directions to unfamiliar places</li> <li><input type="checkbox"/> I can use counting sequences to solve problems</li> <li><input type="checkbox"/> I can discuss the reasonableness of the answer</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can connect names, numerals and quantities</li> <li><input type="checkbox"/> I can <b>partition</b> numbers in various ways</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can compare length using <b>informal</b> units</li> <li><input type="checkbox"/> I can justify representations of data</li> <li><input type="checkbox"/> I can explain patterns that have been created</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can include counting number in sequences readily forward and backwards</li> <li><input type="checkbox"/> I can locate numbers on a line</li> <li><input type="checkbox"/> I can name the days of the week</li> </ul>

Number and Algebra Level 1	Measurement and Geometry Level 1	Statistics and Probability Level 1
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can count to and from 100</li> <li><input type="checkbox"/> I can locate numbers between 0-100 on a number line.</li> <li><input type="checkbox"/> I can <b>partition</b> numbers using place value</li> <li><input type="checkbox"/> I can carry out simple additions and subtractions</li> <li><input type="checkbox"/> I can use counting strategies (counting on, partitioning, re-arranging)</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify one half of a whole</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can recognise and describe Australian coins according to their value</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can skip counting by 2s, 5s and 10s from 0</li> <li><input type="checkbox"/> I can continue and describe patterns using numbers and objects</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use <b>informal</b> units of measurement to order objects based on length</li> <li><input type="checkbox"/> I can use informal units of measurement to order objects in order of <b>capacity</b></li> <li><input type="checkbox"/> I can tell time to the half-hour</li> <li><input type="checkbox"/> I can explain time in terms of months, days, weeks and hours</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can describe <b>two-dimensional</b> shapes</li> <li><input type="checkbox"/> I can describe <b>three-dimensional</b> objects</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use the language of distance and direction to move from place to place</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use language of certain, possible and impossible</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can describe <b>data displays</b>.</li> <li><input type="checkbox"/> I can ask questions to collect</li> <li><input type="checkbox"/> I can draw simple <b>data displays</b></li> </ul>

## Year Two – The Big Idea is Place-value, the importance of moving beyond counting by ones, the structure of the base 10 numeration system

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulate problems from authentic situations</li> <li><input type="checkbox"/> I can make models using number sentences that represent problem situations</li> <li><input type="checkbox"/> I can plan routes on maps</li> <li><input type="checkbox"/> I can match transformations with their original shape</li> <li><input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can connect numbers with counting sequences</li> <li><input type="checkbox"/> I can <b>partition</b> and combine numbers</li> <li><input type="checkbox"/> I can identify and describe the relationship between addition and subtraction and between multiplication and division</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can use facts for strategies for unfamiliar calculations</li> <li><input type="checkbox"/> I can compare and contrast related models of operations</li> <li><input type="checkbox"/> I can describe connections between <b>2D</b> and <b>3D</b> shapes</li> <li><input type="checkbox"/> I can create and interpret simple representations of data</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can count numbers in sequences</li> <li><input type="checkbox"/> I can use units to compare measurements</li> <li><input type="checkbox"/> I can list possible outcomes of chance events</li> <li><input type="checkbox"/> I can describe and compare time i.e. days/weeks/hours</li> </ul>

Number and Algebra Level 2	Measurement and Geometry Level 2	Statistics and Probability Level 2
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can count to and from 1000</li> <li><input type="checkbox"/> I can and order numbers up to 1000</li> <li><input type="checkbox"/> I can show addition and subtraction and explore the connection between the two</li> <li><input type="checkbox"/> I can use a range of strategies (group, <b>partition</b>, and re arrange, <b>commutativity</b>, <b>building to 10</b>, doubles, <b>10 facts</b> and adding to 10)</li> <li><input type="checkbox"/> I can show multiplication (<b>repeated addition</b>, groups and <b>arrays</b>) and division by grouping into sets</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can divide collections and shapes into halves, quarters and eighths</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can find the total value of collections of Australian notes and coins</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can recognise increasing and decreasing number sequences involving 2s, 3s, 5s and 10s</li> <li><input type="checkbox"/> I can show the missing number in a number sequence</li> <li><input type="checkbox"/> I can use technology to produce sequences by <b>constant addition</b></li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can order shapes and objects, using <b>informal</b> units for a range of measures</li> <li><input type="checkbox"/> I can tell time to the quarter hour</li> <li><input type="checkbox"/> I can use a calendar to identify the date, days, weeks and months</li> <li><input type="checkbox"/> I can use a calendar to show seasons and other events</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can draw <b>two dimensional</b> shapes</li> <li><input type="checkbox"/> I can talk about <b>two dimensional</b> shapes and explain features</li> <li><input type="checkbox"/> I can recognise the features of <b>three dimensional</b> objects</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can explain the effects of one-step <b>transformations</b></li> <li><input type="checkbox"/> I can interpret simple maps of familiar locations</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can describe outcomes of familiar events using everyday language</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can collect data (information) from relevant questions to create lists, tables and picture graphs with and without the use of digital technology</li> <li><input type="checkbox"/> I can interpret data in context</li> </ul>

Year Three – The Big Idea is **Multiplicative** thinking, the key to understanding **rational number** and developing efficient mental and written **computation** strategies in later years

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can collect information to use in graphs</li> <li><input type="checkbox"/> I can make models of <b>three dimensional</b> objects</li> <li><input type="checkbox"/> I can use numbers to continue number pattern</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can connect number patterns with number sequences</li> <li><input type="checkbox"/> I can <b>partition</b> and combine numbers to show unit fractions</li> <li><input type="checkbox"/> I can communicate times i.e. weeks, months, hours, minutes, seconds</li> <li><input type="checkbox"/> I can identify <b>symmetry</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can use and explain estimating and checking</li> <li><input type="checkbox"/> I can compare angles</li> <li><input type="checkbox"/> I can create and interpret variations in the results of data collections and data displays</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can recall multiplication facts</li> <li><input type="checkbox"/> I can use metric units to order and compare objects</li> <li><input type="checkbox"/> I can identify and describe outcomes of chance experiments</li> <li><input type="checkbox"/> I can interpret maps and communicate positions</li> </ul>

Number and Algebra Level 3	Measurement and Geometry Level 3	Statistics and Probability Level 3
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can count to and from 10 000</li> <li><input type="checkbox"/> I can order numbers to and from 10 000</li> <li><input type="checkbox"/> I can show the connection between addition and subtraction</li> <li><input type="checkbox"/> I can solve problems for multiplication: drawing a picture, using a table, working backwards (2s, 3s, 5s, 10s)</li> <li><input type="checkbox"/> I can recall addition and multiplication facts for single-digit numbers</li> <li><input type="checkbox"/> I can <b>partition</b>, rearrange and regroup to 10 000</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can model and represent fractions for halves, thirds, quarters, fifths and eighths, and multiples of these up to one</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can show money values in various ways</li> <li><input type="checkbox"/> I can correctly count out change</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can classify numbers as odd or even</li> <li><input type="checkbox"/> I can continue number patterns involving addition or subtraction</li> <li><input type="checkbox"/> I can explore simple number sequences based on multiples</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use mm, cm, m, km for length</li> <li><input type="checkbox"/> I can use gm, kg for mass</li> <li><input type="checkbox"/> I can use litre and ml for capacity</li> <li><input type="checkbox"/> I can tell time to the nearest minute</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify <b>symmetry</b></li> <li><input type="checkbox"/> I can use angles to measure a turn</li> <li><input type="checkbox"/> I can make models of <b>three dimensional</b> objects</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can match positions on maps with given information</li> <li><input type="checkbox"/> I can create simple maps</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can conduct chance experiments</li> <li><input type="checkbox"/> I can list possible outcomes of events</li> <li><input type="checkbox"/> I can explain differences in results</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can carry out simple data investigations</li> <li><input type="checkbox"/> I can interpret and compare graph and information in a table</li> </ul>

Year Four – The Big Idea is **Multiplicative** thinking, the key to understanding **rational number** and developing efficient mental and written **computation** strategies in later years

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulate, model and record addition, subtraction, multiplication and division</li> <li><input type="checkbox"/> I can compare large numbers</li> <li><input type="checkbox"/> I can compare lengths of time</li> <li><input type="checkbox"/> I can use numbers to continue patterns</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can make connections between numbers</li> <li><input type="checkbox"/> I can <b>partition</b> and combine numbers</li> <li><input type="checkbox"/> I can extend <b>place value</b> to decimals</li> <li><input type="checkbox"/> I can communicate time</li> <li><input type="checkbox"/> I can use <b>informal</b> units for comparing and describing shapes</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can use estimation to check results of calculations</li> <li><input type="checkbox"/> I can use strategies for multiplication and division tasks – <b>repeated addition, arrays</b>, doubling, skip counting, number facts</li> <li><input type="checkbox"/> I can compare angles</li> <li><input type="checkbox"/> I can communicating information using graphs</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can recall multiplication tables</li> <li><input type="checkbox"/> I can communicate sequences of fractions</li> <li><input type="checkbox"/> I can create patterns with shapes and their <b>transformations</b></li> <li><input type="checkbox"/> I can collect and record data</li> </ul>

Number and Algebra Level 4	Measurement and Geometry Level 4	Statistics and Probability Level 4
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can recall multiplication and division facts to 10 x 10</li> <li><input type="checkbox"/> I can order numbers to and from 10 000</li> <li><input type="checkbox"/> I can choose strategies for calculations involving multiplication and division (3s, 4s, 6s, 7s, 8s, 9s) <b>repeated addition, arrays</b>, doubling, skip counting, number facts</li> <li><input type="checkbox"/> I can estimate answers</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can locate familiar fractions on a number line</li> <li><input type="checkbox"/> I can recognise common equivalent fractions in familiar contexts</li> <li><input type="checkbox"/> I can make connections between fractions and decimal notations up to two decimal places e.g. <math>\frac{1}{4} = 0.25</math></li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve simple purchasing problems with and without the use of digital technology (nearest 5c)</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify unknown quantities in number sentences e.g. <math>23 + ? = 57 - 19</math></li> <li><input type="checkbox"/> I can describe number patterns resulting from multiplication</li> <li><input type="checkbox"/> I can continue number sequences involving multiples of single-digit numbers ( 2, 4, 6) and unit fractions (<math>\frac{1}{2}</math>, 1, <math>1\frac{1}{2}</math>) and locate them on a number line</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can compare areas of regular and irregular shapes, using informal units (counting squares on grid paper)</li> <li><input type="checkbox"/> I can solve problems involving time</li> <li><input type="checkbox"/> I can use tape measure, ruler to measure length of shapes and objects</li> <li><input type="checkbox"/> I can use a protractor to measure angles of shapes and objects</li> <li><input type="checkbox"/> I can use <math>\text{mm}^2</math>, <math>\text{cm}^2</math>, <math>\text{m}^2</math> to measure area of shapes and objects</li> <li><input type="checkbox"/> I can use g, mg, kg to measure mass of objects</li> <li><input type="checkbox"/> I can use L, ml to measure capacity of objects</li> <li><input type="checkbox"/> I can measure temperature</li> <li><input type="checkbox"/> I can convert seconds, minutes, hours</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can create <b>symmetrical</b> shapes</li> <li><input type="checkbox"/> I can create patterns, with and without the use of digital technology</li> <li><input type="checkbox"/> I can classify angles in relation to a right angle</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can interpret information contained in maps ie legends, scales and directions</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can list the probabilities of everyday events</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can describe different methods for data collection (survey, questions) and representation (tables, graphs)</li> <li><input type="checkbox"/> I can make tables and graphs from given or collected data</li> </ul>

## Year Five – The Big Idea is **Partitioning**, the missing link in building common fraction and decimal knowledge and confidence

	Problem Solving	Understanding	Reasoning	Fluency
Proficiencies	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulate and solve authentic problems using numbers</li> <li><input type="checkbox"/> I can create transformations</li> <li><input type="checkbox"/> I can identify line and rotational symmetries</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can make connections between representations of numbers</li> <li><input type="checkbox"/> I can use fractions to represent probabilities</li> <li><input type="checkbox"/> I can compare and order fractions and decimals</li> <li><input type="checkbox"/> I can represent them in various ways</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can investigate strategies to perform calculations efficiently</li> <li><input type="checkbox"/> I can create financial plans</li> <li><input type="checkbox"/> I can interpret results of chance experiments</li> <li><input type="checkbox"/> I can interpret data sets</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can choose appropriate units of measurement for calculation of perimeter and area</li> <li><input type="checkbox"/> I can use estimation to check the reasonableness of answers to calculations</li> <li><input type="checkbox"/> I can use instruments to measure angles</li> </ul>

Number and Algebra Level 5	Measurement and Geometry Level 5	Statistics and Probability Level 5
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve simple problems involving addition, subtraction, multiplication and division</li> <li><input type="checkbox"/> I can estimate my answers by <b>rounding</b></li> <li><input type="checkbox"/> I can identify and describe <b>factors</b> and <b>multiples</b></li> <li><input type="checkbox"/> I can solve one and two digit multiplication problems</li> <li><input type="checkbox"/> I can divide 2 digit numbers by one digit numbers with remainders</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can order decimals and unit fractions</li> <li><input type="checkbox"/> I can locate decimals and unit fractions on a number line beyond 100ths</li> <li><input type="checkbox"/> I can add and subtract fractions with the same <b>denominator</b></li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can explain plans for simple budgets</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can find unknown quantities in number sentences</li> <li><input type="checkbox"/> I can continue patterns by adding or subtracting fractions and decimals</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use a tape measure, ruler, trundle wheel to measure length</li> <li><input type="checkbox"/> I can use mm<sup>2</sup>, cm<sup>2</sup>, m<sup>2</sup>, km<sup>2</sup>, km<sup>3</sup> to measure area of shapes and objects</li> <li><input type="checkbox"/> I can use appropriate units of measurement for volume (cubic millimetre mm<sup>3</sup> cubic centimetre cm<sup>3</sup>, cubic metre m<sup>3</sup>)</li> <li><input type="checkbox"/> I can use L, ml to measure capacity</li> <li><input type="checkbox"/> I can use g, mg, kg, tonne to measure mass of objects</li> <li><input type="checkbox"/> I can calculate perimeter and area of rectangles</li> <li><input type="checkbox"/> I can convert between 12 and 24-hour time</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can estimate angles</li> <li><input type="checkbox"/> I can use protractors and digital technology to construct and measure angles using degrees</li> <li><input type="checkbox"/> I can connect three dimensional objects with their two dimensional nets</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use a grid reference system to locate landmarks</li> <li><input type="checkbox"/> I can describe <b>transformations</b> of two dimensional shapes</li> <li><input type="checkbox"/> I can identify line and <b>rotational symmetry</b></li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can list outcomes of chance experiments with equally likely outcomes</li> <li><input type="checkbox"/> I can assign probabilities as a number from 0 to 1</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can pose questions to gather data</li> <li><input type="checkbox"/> I can construct various displays appropriate for the data</li> <li><input type="checkbox"/> I can compare and interpret different data sets</li> </ul>



# Year Six – The Big Idea is **Partitioning**, the missing link in building common fraction and decimal knowledge and confidence

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can create and solve problems using numbers and measurements</li> <li><input type="checkbox"/> I can create similar shapes through enlargements (different sizes)</li> <li><input type="checkbox"/> I can represent <b>secondary data</b></li> <li><input type="checkbox"/> I can calculate angles</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can describe <b>properties</b> of different numbers</li> <li><input type="checkbox"/> I can use fractions and decimals to describe probabilities</li> <li><input type="checkbox"/> I can represent fractions/decimals in various ways</li> <li><input type="checkbox"/> I can describe connections between fractions and decimals</li> <li><input type="checkbox"/> I can make reasonable estimations</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can explain <b>mental strategies</b> when solving problems</li> <li><input type="checkbox"/> I can describe results for number sequences</li> <li><input type="checkbox"/> I can investigate angles</li> <li><input type="checkbox"/> I can explain the <b>transformation</b> of one shape into another</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can represent <b>negative numbers</b> on a number line</li> <li><input type="checkbox"/> I can calculate simple percentages</li> <li><input type="checkbox"/> I can use brackets appropriately</li> <li><input type="checkbox"/> I can convert between fractions and decimals</li> <li><input type="checkbox"/> I can use <b>operations</b> with fractions, decimals &amp; %</li> <li><input type="checkbox"/> I can measure using metric units</li> <li><input type="checkbox"/> I can interpret timetables</li> </ul>

Number and Algebra Level 6	Measurement and Geometry Level 6	Statistics and Probability Level 6
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can recognise the properties of <b>prime numbers</b></li> <li><input type="checkbox"/> I can recognise the properties <b>composite numbers</b></li> <li><input type="checkbox"/> I can recognise the properties of <b>square numbers</b></li> <li><input type="checkbox"/> I can recognise the properties of <b>triangular numbers</b></li> <li><input type="checkbox"/> I can solve problems that involve all four operations with whole numbers</li> </ul> <p><b>Fractions and Decimals</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can locate fractions and <b>integers</b> on a number line</li> <li><input type="checkbox"/> I can connect fractions, decimals and percentages</li> <li><input type="checkbox"/> I can solve problems involving the addition and subtraction of related fractions</li> <li><input type="checkbox"/> I can make connections between the powers of 10 and the multiplication and division of decimals</li> <li><input type="checkbox"/> I can add decimals</li> <li><input type="checkbox"/> I can subtract decimals</li> <li><input type="checkbox"/> I can multiply decimals</li> <li><input type="checkbox"/> I can divide decimals</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculate common percentage discounts on sale items – 10%, 25%, 50%</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can write number sentences using brackets and order of operations</li> <li><input type="checkbox"/> I can specify rules used to generate sequences involving whole numbers, fractions and decimals.</li> <li><input type="checkbox"/> I can use ordered pairs of <b>integers</b> to represent <b>coordinates of points</b> and locate them</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can relate decimals to the metric system and choose appropriate units of measurement to perform a calculation</li> <li><input type="checkbox"/> I can solve problems involving length and area</li> <li><input type="checkbox"/> I can make connections between capacity and volume</li> <li><input type="checkbox"/> I can interpret a variety of everyday timetables</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can make simple prisms and pyramids</li> <li><input type="checkbox"/> I can investigate simple combinations of <b>transformations</b></li> </ul> <p><b>Geometric Reasoning</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can show angles as a straight line</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can communicate probabilities of events</li> <li><input type="checkbox"/> I can use simple ratios, fractions, decimals and percentages as a unit of chance and probability</li> <li><input type="checkbox"/> I can compare observed and expected frequencies of events</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can interpret and compare a variety of data displays, including displays for two <b>categorical variables</b></li> <li><input type="checkbox"/> I can analyse and evaluate data from secondary sources</li> </ul>

# Year Seven – The Big Idea is **proportional reasoning**, needed to solve problems involving fractions, decimals, per cent, ratio, rate and proportion

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulating and solving problems using numbers and measurements</li> <li><input type="checkbox"/> I can creating <b>transformations</b></li> <li><input type="checkbox"/> I can identifying <b>symmetry</b></li> <li><input type="checkbox"/> I can calculating angles</li> <li><input type="checkbox"/> I can interpreting sets of data collected through chance experiments</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can describing patterns in uses of <b>indices</b> with whole numbers</li> <li><input type="checkbox"/> I can recognising commonalities between fractions, decimals, percentages and ratios</li> <li><input type="checkbox"/> I can plotting points on the <b>Cartesian plane</b></li> <li><input type="checkbox"/> I can identifying angles formed by a <b>transversal crossing</b> a pair of <b>parallel lines</b></li> <li><input type="checkbox"/> I can connecting the laws and properties of numbers to <b>algebraic terms</b> and expressions</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can applying the number laws to calculations</li> <li><input type="checkbox"/> I can applying known geometric facts to draw conclusions about shapes</li> <li><input type="checkbox"/> I can applying an understanding of ratio</li> <li><input type="checkbox"/> I can interpreting data displays</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculating accurately with <b>integers</b></li> <li><input type="checkbox"/> I can representing fractions and decimals in various ways</li> <li><input type="checkbox"/> I can investigating best buys</li> <li><input type="checkbox"/> I can calculating areas of shapes and volumes of prisms</li> </ul>

Number and Algebra Level 7	Measurement and Geometry Level 7	Statistics and Probability Level 7
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems involving the order, addition and subtraction of <b>integers</b>.</li> <li><input type="checkbox"/> I can make the connections between whole numbers and <b>index notation</b></li> <li><input type="checkbox"/> I can explain the relationship between <b>perfect squares</b> and <b>square roots</b></li> </ul> <p><b>Real Numbers</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems involving all four operations with fractions, decimals, percentages</li> <li><input type="checkbox"/> I can write fractions in their simplest form</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can compare the cost of items to make financial decisions</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use letters to represent numbers</li> <li><input type="checkbox"/> I can connect the laws and properties of number to algebra</li> <li><input type="checkbox"/> I can create <b>algebraic expressions</b></li> </ul> <p><b>Linear and Non Linear Relationships</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can plot points on a <b>Cartesian plane</b></li> <li><input type="checkbox"/> I can find coordinates for a given point</li> <li><input type="checkbox"/> I can solve simple <b>linear equations</b></li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use formulas for the area and perimeter of rectangles</li> <li><input type="checkbox"/> I can calculate volumes of rectangular prisms</li> </ul> <p><b>Shape</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can classify triangles and quadrilaterals</li> <li><input type="checkbox"/> I can describe different views of three dimensional objects</li> <li><input type="checkbox"/> I can use models, sketches and digital technology to represent these views</li> </ul> <p><b>Location and Transformation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can represent transformations of these shapes on the Cartesian plane</li> </ul> <p><b>Geometric Reasoning</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can name the types of angles formed by a <b>transversal crossing parallel line</b></li> <li><input type="checkbox"/> I can solve simple numerical problems involving lines and angles</li> <li><input type="checkbox"/> I can classify triangles according to their side and angle properties and describe quadrilaterals</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can determine a sample for simple experiments with equally likely outcomes, and assign probabilities outcomes</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify issues involving the collection of <b>discrete</b> and <b>continuous data</b> from primary and secondary sources</li> <li><input type="checkbox"/> I can construct <b>stem-and-leaf plots</b> and <b>dot-plots</b></li> <li><input type="checkbox"/> I can identify or calculate <b>mean, mode, median</b> and range for data sets, using digital technology for larger data sets</li> <li><input type="checkbox"/> I can describe the relationship between the <b>median</b> and <b>mean</b> in graphs</li> </ul>

# Year Eight – The Big Idea is **proportional reasoning**, needed to solve problems involving fractions, decimals, per cent, ratio, rate and proportion

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulating and modelling with comparisons of ratios</li> <li><input type="checkbox"/> I can profit and loss</li> <li><input type="checkbox"/> I can solve situations involving area and perimeter of common shapes</li> <li><input type="checkbox"/> I can analysing and interpreting data using two way tables</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can describing patterns in uses of indices and repeating decimals</li> <li><input type="checkbox"/> I can connecting <b>rules of relations</b> and functions of graphs</li> <li><input type="checkbox"/> I can explaining the function of <b>statistical measures</b></li> <li><input type="checkbox"/> I can comparing measurements of perimeter and area</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can justifying estimation as reasonable</li> <li><input type="checkbox"/> I can explaining use of ratios for comparing rates and prices</li> <li><input type="checkbox"/> I can using <b>congruence</b> to show properties of triangles</li> <li><input type="checkbox"/> I can making inferences about data</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculating accurately with simple decimals, <b>indices</b> and <b>integers</b></li> <li><input type="checkbox"/> I can recognising equivalence of common decimals/fractions including <b>repeating decimals</b></li> <li><input type="checkbox"/> I can <b>factorising</b> and simplifying basic <b>algebraic expressions</b></li> <li><input type="checkbox"/> I can calculating perimeters, areas and volumes of common shapes</li> <li><input type="checkbox"/> I can calculating the mean &amp; median of small sets of data</li> </ul>

Number and Algebra Level 8	Measurement and Geometry Level 8	Statistics and Probability Level 8
<p><b>Number and Place Value</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use efficient mental and written strategies to make estimates</li> <li><input type="checkbox"/> I can carry out the four operations with integers, and apply the <b>index laws</b> to whole numbers</li> <li><input type="checkbox"/> I can use <b>index notation</b> with numbers to work out <b>index laws</b></li> </ul> <p><b>Real Numbers</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can investigate <b>recurring</b> and <b>terminating</b> decimals</li> <li><input type="checkbox"/> I can identify and describe <b>rational</b> and <b>irrational</b> numbers</li> <li><input type="checkbox"/> I can estimate answers and solve everyday problems involving profit and loss rates, ratios and percentages, with and without the use of digital technology</li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems involving profit and loss</li> </ul> <p><b>Patterns and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can simplify a variety of <b>algebraic expressions</b> and connect expansion and <b>factorisation of linear expressions</b></li> </ul> <p><b>Linear and non-linear relationships</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve <b>linear equations</b> using <b>algebraic</b> and <b>graphical</b> techniques</li> <li><input type="checkbox"/> I can solve <b>linear equations</b> and graph linear relationships on the <b>Cartesian plane</b> (x and y axis)</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can convert units of measurement for area and for volume – use squared and cubed measures</li> <li><input type="checkbox"/> I can find the perimeter and area of parallelograms, rhombuses and kites</li> <li><input type="checkbox"/> I can name the features of circles, calculate circumference and area, and solve problems relating to the volume of prisms</li> <li><input type="checkbox"/> I can make sense of time duration including the use of 24-hour time</li> </ul> <p><b>Geometric Reasoning</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify conditions for the congruence of triangles and determine the properties of quadrilaterals</li> <li><input type="checkbox"/> I can use tools,(compass, ruler) including digital technology to construct congruent shapes</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can determine <b>complementary events</b> and calculate the sum of probabilities</li> <li><input type="checkbox"/> I can model situations with Venn diagrams and two-way tables</li> <li><input type="checkbox"/> I can explain the use of 'not', 'and' and 'or' in probability outcomes</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can explain issues related to the collection of sample data</li> <li><input type="checkbox"/> I can discuss the effect of outliers on means and medians of the data</li> <li><input type="checkbox"/> I can use various approaches, including the use of digital technology, to generate simple random samples from a population</li> <li><input type="checkbox"/> I can choose appropriate language to describe events and experiments i.e. unlikely, even, unequal, possibility, likelihood</li> </ul>

## Year Nine – The Big Idea is generalising, fundamental to engaging with broader curricula expectations at this level.

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculating surface areas and volumes of <b>right prisms</b></li> <li><input type="checkbox"/> I can applying ratio and scale</li> <li><input type="checkbox"/> I can solving problems involving <b>right angle trigonometry</b></li> <li><input type="checkbox"/> I can collecting data from <b>secondary sources</b> to investigate an issue</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can describing the relationship between graphs and equations</li> <li><input type="checkbox"/> I can simplifying a range of <b>algebraic expressions</b></li> <li><input type="checkbox"/> I can explaining the function of <b>relative frequencies</b> and probabilities</li> <li><input type="checkbox"/> I can calculating areas of shapes and surface areas of prisms</li> <li><input type="checkbox"/> I can constancy of the <b>trigonometric ratios</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can following mathematical arguments</li> <li><input type="checkbox"/> I can evaluating media reports and using statistical knowledge to draw conclusions</li> <li><input type="checkbox"/> I can developing strategies in investigating similarity</li> <li><input type="checkbox"/> I can sketching <b>linear graphs</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can applying the <b>index laws</b> to <b>expressions</b> with <b>integer indices</b></li> <li><input type="checkbox"/> I can writing numbers in scientific notation</li> <li><input type="checkbox"/> I can listing outcomes for experiments</li> <li><input type="checkbox"/> I can developing familiarity with calculations involving the <b>Cartesian plane</b></li> </ul>

Number and Algebra Level 9	Measurement and Geometry Level 9	Statistics and Probability Level 9
<p><b>Real Numbers</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems using <b>direct proportion</b></li> <li><input type="checkbox"/> I can apply index laws to <b>numerical expressions</b></li> <li><input type="checkbox"/> I can express numbers in <b>scientific notation</b></li> </ul> <p><b>Money and Financial Matters</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems using simple interest</li> </ul> <p><b>Pattern and Algebra</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can apply the index laws using <b>integer indices</b> to <b>variables</b> and numbers</li> <li><input type="checkbox"/> I can use the <b>distributive law</b> to expand <b>algebraic expressions</b>, including <b>binomial expressions</b>, and simplify a range of <b>algebraic expressions</b></li> </ul> <p><b>Linear and Non Linear Relationship</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can find the distance between two points on the <b>Cartesian plane</b> and the <b>gradient</b> and midpoint of a line segment</li> <li><input type="checkbox"/> I can solve problems involving very small and very large numbers and check the order of calculations</li> <li><input type="checkbox"/> I can solve problems involving simple interest</li> <li><input type="checkbox"/> I can sketch and draw <b>linear</b> and <b>non-linear</b> relations</li> <li><input type="checkbox"/> I can solve simple <b>related equations</b> and explain the relationship between the <b>graphical</b> and <b>symbolic</b> forms</li> </ul>	<p><b>Using units of measurement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculate the areas of <b>composite shapes</b></li> <li><input type="checkbox"/> I can calculate the surface area and volume of cylinders and solve problems</li> <li><input type="checkbox"/> I can solve measurement problems involving perimeter and area of composite shapes, surface area and volume of rectangular prisms and cylinders</li> <li><input type="checkbox"/> I can use very small and very large time scales and intervals</li> </ul> <p><b>Geometry Reasoning</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use <b>enlargement transformation</b> to explain similarities in triangles</li> <li><input type="checkbox"/> I can solve problems using <b>ratio</b> and <b>scale</b> factors</li> </ul> <p><b>Pythagoras and Trigonometry</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can investigate <b>Pythagoras</b> to solve simple problems with right angled triangles</li> <li><input type="checkbox"/> I can use <b>sine, cosine and tangent</b> ratios for right angled triangles</li> <li><input type="checkbox"/> I can apply <b>trigonometry</b> to solve right angled triangle problems</li> </ul>	<p><b>Chance</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can list outcomes for two-step experiments and assign probabilities for those outcomes and related events</li> <li><input type="checkbox"/> I can calculate relative frequencies to estimate probabilities</li> </ul> <p><b>Data representation and interpretation</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can compare techniques for collecting data from <b>primary</b> and <b>secondary sources</b></li> <li><input type="checkbox"/> I can identify questions and issues involving different data types</li> <li><input type="checkbox"/> I can construct <b>histograms</b> and back-to-back <b>stem-and-leaf plots</b></li> <li><input type="checkbox"/> I can identify <b>mean</b> and <b>median</b> in <b>skewed, symmetric</b> and <b>bi-modal</b> displays and use these to describe and interpret the range of the data</li> </ul>

## Year Ten – The Big Idea is generalising, fundamental to engaging with broader curricula expectations at this level.

	Problem Solving	Understanding	Reasoning	Fluency
<b>Proficiencies</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can calculating the surface area and volume of prisms</li> <li><input type="checkbox"/> I can finding unknown lengths and angles using <b>trigonometry</b></li> <li><input type="checkbox"/> I can using <b>algebraic</b> and <b>graphical</b> techniques to find solutions to <b>simultaneous equations</b> and <b>inequalities</b></li> <li><input type="checkbox"/> I can investigating independence of events and their probabilities</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can describing patterns in uses of <b>indices</b></li> <li><input type="checkbox"/> I can applying the four operations to <b>algebraic fractions</b></li> <li><input type="checkbox"/> I can finding unknowns in formulas</li> <li><input type="checkbox"/> I can making the connection between <b>algebraic</b> and <b>graphical representations</b> of relations</li> <li><input type="checkbox"/> I can connecting simple and compound interest in financial contexts</li> <li><input type="checkbox"/> I can determining probabilities</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulating <b>geometric proofs</b> involving congruence and similarity</li> <li><input type="checkbox"/> I can interpreting and evaluating media statements</li> <li><input type="checkbox"/> I can interpreting and comparing data sets</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulating proofs using congruent triangles and angle properties</li> <li><input type="checkbox"/> I can factorising and expanding <b>algebraic expressions</b></li> <li><input type="checkbox"/> I can using a range of strategies to solve equations</li> <li><input type="checkbox"/> I can using calculations to investigate the shape of data sets</li> </ul>

Number and Algebra Level 10	Measurement and Geometry Level 10	Statistics and Probability Level 10
<p>Money and Financial Matters</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I recognise the connection between <b>simple</b> and <b>compound</b> interest</li> </ul> <p>Patterns and Algebra</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can <b>factorise algebraic expressions</b></li> <li><input type="checkbox"/> I can simplify <b>algebraic products</b> and <b>quotients</b></li> <li><input type="checkbox"/> I can apply the four operations to simple <b>algebraic fractions</b> with <b>denominators</b></li> </ul> <p>Linear and Non Linear Relationships</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve problems involving <b>linear equations</b> and <b>inequalities</b>, <b>quadratic equations</b> and pairs of <b>simultaneous linear equations</b> and related graphs</li> <li><input type="checkbox"/> I can find unknown values after substitution into formulas, manipulate <b>linear algebraic expressions</b>, expand <b>binomial expressions</b> and <b>factorise monic</b> and <b>simple non-monic quadratic expressions</b></li> <li><input type="checkbox"/> I can represent <b>linear</b>, <b>quadratic</b> and <b>exponential functions</b> numerically, graphically and <b>algebraically</b>, and use them to model situations and solve practical problems</li> </ul>	<p>Using units of measurement</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve and explain surface area and volume problems relating to <b>composite solids</b></li> </ul> <p>Geometry Reasoning</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can formulate proofs involving <b>congruent</b> triangles and angle properties</li> <li><input type="checkbox"/> I can apply logical reasoning that includes use of congruence and similarity, to proofs and numerical exercises involving plane shapes</li> </ul> <p>Pythagoras and Trigonometry</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can solve <b>right handed triangle</b> problems involving direction and angles</li> <li><input type="checkbox"/> I can use <b>parallel</b> and <b>perpendicular</b> line, angle and triangle properties, similarity, <b>trigonometry</b> and <b>congruence</b> to solve practical problems and develop proofs involving lengths, angles and areas in plane shapes</li> <li><input type="checkbox"/> I can use digital technology to construct and manipulate geometric shapes and objects</li> <li><input type="checkbox"/> I can explore symmetry and pattern in two dimensions</li> </ul>	<p>Chance</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can list outcomes for multi-step chance experiments involving <b>independent</b> and <b>dependent events</b>, and assign probabilities for these experiments</li> <li><input type="checkbox"/> I can use the language of 'if', 'given', 'of'</li> </ul> <p>Data representation and interpretation</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can use <b>quartiles</b> and <b>interquartiles</b></li> <li><input type="checkbox"/> I can use <b>box plots</b> to compare data sets</li> <li><input type="checkbox"/> I can use <b>histograms</b> and <b>dot plots</b> to compare data</li> <li><input type="checkbox"/> I can use <b>scatter plots</b></li> <li><input type="checkbox"/> I can use <b>bivariate numerical</b> data</li> <li><input type="checkbox"/> I can compare <b>univariate data</b> sets by referring to <b>summary statistics</b> and the shape of their displays</li> <li><input type="checkbox"/> I can evaluate the use of statistics in the media</li> </ul>

# Glossary of Mathematical terms

Glossary of Mathematical terms can be found on the VCAA website. Follow the links below:

<http://ausvels.vcaa.vic.edu.au/static/docs/mathematics.pdf>

<https://www.mathsisfun.com/index.htm>

10 facts	Are a combination of numbers that make 10 eg. $1+9$ , $2+8$ , $3+7$
2D - two dimensional	Shapes with two dimensions eg. length and width, thus having no depth. Simple shapes include a circle, triangle, square and rectangle. More complex shapes are semi circle, rhombus, parallelogram, pentagon, hexagon, heptagon, octagon, nonagon, decagon
3D – three dimensional	Shapes with three dimensions eg. length, width and height. They include cubes, prisms, pyramids, sphere, cylinder, cone
algebraic expressions	A mathematical phrase which can contain numbers, operators (add, subtract, multiply, divide), and at least one variable (like $x$ , $y$ ) to represent operations. An example of an algebraic expression is $x + 5$ $4n \div 6$ .
algebraic products	The result we get when multiplying within an algebraic equation
algebraic technique	Substitute or eliminate parts of an equation to solve it (e.g. $2x=10$ , divide each side by 2 and $x=5$ )
<b>algebraic term</b>	
angle	The amount of turn between two straight lines that have a common end point (the vertex). e.g. right, straight, revolution, acute, obtuse, reflex, adjacent, complementary and corresponding
arrays	Set of objects or numbers arranged in rows and columns. They make counting and calculating easier.
back to back stem and leaf plot	Is a method for comparing two data lists
bi-modal display	Data that has two modes – so two numbers that occur more frequently
binomial expressions	Is an algebraic expression containing 2 terms For example, $(x + y)$ is a binomial
bivariate numerical data	Is data for relating to two variables for example height and weight
box plots	Is the same as a box and whisker plot. This separates data into quartiles: the box is the middle 50% and top whisker is top 25% and the bottom whisker is the lowest 25%
building to 10	How many do we need to make up to 10. Eg. 4 and 6, 5 and 5, 9 and 1
capacity	How much a container will hold, often fluids in litres and millilitres
Cartesian plane	Is a plane (meaning that it's flat) made up of an $x$ axis (the horizontal line) and a $y$ axis (the vertical line).
Cartesian Co-ordinates	Two intersecting number lines intersecting at right angles to create 4 quadrants. The $x$ and $y$ axis then produce co ordinates in positive and negative numbers
categorical variables	A category that has many within it – ie soft drink can coke, lemonade, sprite
commutativity	Does not rely on an order to solve a problem
complementary events	Are two outcomes of an event that are the only two possible outcomes. This is like flipping a coin and getting heads or tails
composite numbers	A natural number (whole number, not negative) that has a factor other than 1 and itself
composite shapes	A shape is a composite figure if it consists of two basic figures. That is, a figure is formed by a rectangle and triangle. The area of

	a composite figure is calculated by dividing the composite figure into basic figures and then using the relevant area formula for each basic figure.
composite solids	Is a solid that is composed or made up of two or more solids
compound interest	The interest earned by investing a sum of money (the principal) is compound interest if each successive interest payment is added to the principal for the purpose of calculating the next interest payment.
congruence	Two shapes that can be moved, translated, rotated or reflected so that they fit on top of each other. The length, width and angles are the same.
constant addition	Adding the same amount each time $5+5+5+5$
continuous data	Is information that can be measured on a continuum or scale
coordinates of points	Are a pair of numbers that define an exact location on a two-dimensional plane. The coordinate plane has two axes at right angles to each other, called the x and y axis
counting on	To count up from a given number
cosine	The trigonometric function that is equal to the ratio of the side adjacent to an acute angle (in a right-angled triangle) to the hypotenuse
data	The general term for information collected
data displays	Is the visual form that data takes when organised and/or summarised – graphs, tables, plots
denominator	The number at the bottom of a fraction that tells you how many parts altogether
dependent events	Two events are dependent if the outcome or occurrence of the first affects the outcome or occurrence of the second so that the probability is changed
direct proportion	The relation between quantities whose ratio is constant - two things that are in the same <i>proportion</i> is the amount of apples you might buy and the amount you pay for them
discrete data	Discrete data is based on counts. Only a finite number of values is possible, and the values cannot be subdivided meaningfully. For example, the number of parts damaged in shipment.
distributive law	The law relating the operations of multiplication and addition, stated symbolically, $a(b + c) = ab + ac$ ; the monomial (an algebraic expression consisting of one term) factor is distributed, or separately applied, to each term of the binomial factor $b + c$ , resulting in the product $ab + ac$
dot plots	A dot chart or dot plot is a statistical chart consisting of data points plotted on a fairly simple scale, typically using filled in circles
enlargement	A scaled up or down version of something
exponential functions	a function whose value is a constant raised to the power of the argument example $5^3 = 5 \times 5 \times 5$
factorising	A number or algebraic expression is to express it as a product
factors	A number that divides exactly into another number. a whole number that multiplies with another number to make a third number
geometric proofs	A geometric proof involves writing reasoned, logical explanations that use definitions, axioms, postulates, and previously proved theorems to arrive at a conclusion about a geometric statement
gradient	An inclined part of a road or railway; a slope on a shape
graphical form	A graph

graphical technique	The type of graphs we use to present information
histograms	Is a graph in a frequency table (number of times an event occurs)
independent events	Baking bread at a temperature as opposed to how long it is in the oven
index laws	Rules for working out indices $x^a x^b = x^{a+b}$
index notation	Is a short way of writing a number being multiplied by itself several times. instead of writing: 4 x 4 x 4 it is $4^3$
indices	Plural of index
inequalities	When two values are not equal. There are symbols that show when things are not equal. $a \geq b$ means that a is greater than or equal to b
Informal units	Not part of scaled measurement – use stepping out, paper clips, blocks to measure objects
integer indices	Comparing values
integers	Integers are whole numbers – negative or positive
interquartiles	This is when data is presented in 25% bands
irrational numbers	Is any real number that cannot be expressed as a ratio and cannot be represented as terminating or repeating decimals
linear equations	an equation between two variables that gives a straight line when plotted on a graph
mean	The average of a set of numbers
median	The middle number in a set when they are organised numerically
mental strategies	Some examples are - counting on, using doubles, making to ten, counting back, counting up, using part/part/whole, making to ten and then add, skip counting, multiples of ten, trading, re grouping
mode	The number most often used in a set of numbers
monic quadratic equations	Quadratic equations using money
multiples	Multiples are what we get after multiplying the number by a number (not a fraction)
Negative numbers	Numbers that are less than 0
net	The design of a shape that can be folded to make a 3D shape
non monic quadratic equations	
numerator	the number above the line in a fraction showing how many of the parts indicated by the denominator, for example, 2 in $\frac{2}{3}$
numerical expressions	is a mathematical phrase involving only numbers and one or more operational symbols
operations	This is a question that needs to be solved using addition, subtraction, multiplication or division
parallel	Side by side and having the same distance continuously between them
parallel lines	Two or more lines that run the same distance apart
partition	Is splitting a number into smaller units so they're easier to work with
perfect squares	A number made by squaring a whole number. 16 is a perfect square because $4^2 = 16$ . 25 is also a perfect square because $5^2 = 25$
perpendicular	At right angles ( $90^\circ$ ) to. Eg if one line is at 90degrees to another, it can be said to be perpendicular
place value	The value of the location of a digit in the number. Eg: In 352, the 5 is in the "tens" position, so it shows a value of 50 or In 17.591, the 9 is in the "hundredths" position, so it shows a value of 0.09
prime numbers	A Prime Number can be divided evenly only by 1, or itself. And it must be a whole number greater than 1. eg: 5 can only be divided evenly by 1 or 5, so it is a prime number But 6 can be divided evenly by 1, 2, 3 and 6 so it is NOT a prime number (it is a



	composite number)..
properties	A character or quality that something has. Such as colour, height, weight, etc. Example: Some properties of this shape are: - Its colour is blue - It has 5 sides - It is regular (all sides and angles are equal)
Pythagoras Theorem	In a right angled triangle the square of the long side is equal to the sum of the squares of the other two sides. It is stated in this formula: $a^2 + b^2 = c^2$
quartiles	The values that divide a list of numbers into quarters. In {3, 4, 4, 5, 6, 8, 8} : Quartile 1 (Q1) = 4 Quartile 2 (Q2), which is also the Median, = 5 Quartile 3 (Q3) = 8
quotients	The answer after you divide one number by another. dividend ÷ divisor = quotient. Example: in $12 \div 3 = 4$ , 4 is the quotient
ratio	A ratio shows the relative sizes of two or more values. Example: if there is 1 boy and 3 girls you could write the ratio as: 1:3 (for every one boy there are 3 girls)
rational numbers	A number that can be made by dividing two integers. Eg. <ul style="list-style-type: none"> <li>• <math>\frac{1}{2}</math> is a rational number (1 divided by 2, or the ratio of 1 to 2)</li> <li>• 0.75 is a rational number (<math>\frac{3}{4}</math>)</li> <li>• 1 is a rational number (<math>\frac{1}{1}</math>)</li> </ul>
related equations	A set of equations that all communicate the same relationship between three values, but in different ways
repeated addition	Where $6+6+6+6$ is used instead of $6 \times 4$
repeating decimals	A decimal number that has digits that repeat forever. Eg $\frac{1}{3} = 0.333...$ (the 3 repeats forever)
right angle	An angle which is equal to $90^\circ$ , one quarter of a full revolution.
right prisms	Has a polygon as its base and sides are perpendicular to the base. The base and top are the same shape and size
rotational symmetry	A shape has Rotational Symmetry when it still looks the same after a rotation (of less than one full turn).
rounding	Rounding means making a number simpler but keeping its value close to what it was. The result is less accurate, but easier to use. Eg: 73 rounded to the nearest ten is 70, because 73 is closer to 70 than to 80. But 76 goes up to 80.
rules of relations	The relation between numbers to solve a problem
scale	The ratio of the length in a drawing (or model) to the length of the real thing. Eg in a drawing anything with the size of "1" could have a size of "10" in the real world, so a measurement of 150mm on the drawing would be 1500mm on the real drawing.
scatter plots	A graph of plotted points that show the relationship between two sets of data.
scientific notation	Where a number is written in two parts: First: just the digits (with the decimal point placed after the first digit), Followed by: $\times 10$ to a power that will put the decimal point back where it should be
secondary data	Primary data is data collected by the user. Secondary data is data collected by others. Sources of secondary data include, web based data sets, the media, books, scientific papers, etc.
secondary sources	Is data from articles, papers and are not collected by us
simple interest	Interest calculated as a percent of the original loan. Example: a 3-year loan of \$1,000 at 10% costs 3 lots of 10% So the interest is $3 \times \$1,000 \times 10\% = \$300$
sine	In a right angled triangle, the sine of an angle is: The length of the opposite side divided by the length of the hypotenuse. The abbreviation is sin
skewed data displays	When data has a "long tail" on one side or the other – as distinct from a bell curve

square numbers	To multiply a number by itself. Eg $4 \times 4 = 16$
square root	The square root of a number is a value that, when multiplied by itself, gives the number. Example: $4 \times 4 = 16$ , so a square root of 16 is 4.
statistical measures	Are ways in which you gather and show data
stem and leaf plots	A plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits). Eg "32" is split into "3" (stem) and "2" (leaf). The "stem" values are listed down, and the "leaf" values are listed next to them. This way the "stem" groups the scores and each "leaf" indicates a score within that group.
Subitise	Instantly recognizing the number of objects in a small group, without counting. Example: when you know there are 5 coins here without counting.
summary statistics	The information that gives a quick and simple description of the data. Can include mean, median, mode, minimum value, maximum value, range, standard deviation, etc.
symbolic form	Uses symbols within an equation
symmetric displays	See symmetry
symmetrical	See symmetry
symmetry	Symmetry is when one shape becomes exactly like another if you flip, slide or turn it. The simplest type of Symmetry is "Reflection" (or "Mirror") Symmetry, as shown in this picture of my dog Flame
tangent	A line that just touches a curve at one point, without cutting across it.
terminating decimals	A decimal number that has digits that do not go on forever. eg: 0.25 (it has two decimal digits) 3.0375 (it has four decimal digits) In contrast a Recurring Decimal has digits that go on forever. eg: $1/3 = 0.333\dots$ (the 3 repeats forever) is a Recurring Decimal, not a Terminating Decimal
three dimensional	Shapes with three dimensions e.g. Length, width and height. They include cubes, prisms, pyramids, sphere, cylinder, cone
transformation	Enlargements, reflections, rotations and translations.
transversal crossing	A transversal is a line that meets two or more other lines in a plane.
triangular numbers	The number of dots required to make a triangular array of dots in which the top row consists of just one dot, and each of the other rows contains one more dot than the row above it. So the first triangular number is 1, the second is 3, the third is 6 and so on.
trigonometry	the branch of mathematics dealing with the relations of the sides and angles of triangles and with the relevant functions of any angles
univariate data	"One variable" (one type of data) eg Example: Travel Time (minutes): 15, 29, 8, 42, 35, 21, 18, 42, 26 The variable is Travel Time
variables	A variable is something measurable or observable that is expected to either change over time or between individual observations. Examples of variables in statistics include the age of students, their hair colour or a playing field's length or its shape.