

## New South Wales

### Early Stage One (Kindergarten)

| TOPIC   | RELEVANT EXERCISE  |
|---|--|
| <p><u>Whole Numbers</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Count forwards to 30, from a given number</li> <li>Count backwards from a given number, in the range 0-20.</li> <li>Compare, order, read and represent numbers to at least 20</li> <li>Read and use the ordinal names to at least “tenth”</li> <li>Use the language of money</li> </ul> | <p><b>Concept – counting</b></p> <p><u>Skill – Reading and Printing Numerals</u><br/>Level A and B</p> <p><u>Skill – Counting Backwards</u><br/>Level A and B</p> <p><u>Skill – Reading and Printing Numerals</u><br/>Level A and B</p> <p><u>Skill – Use ordinal numbers</u><br/>Level A</p> <p><u>Skill – Counting Using Money</u><br/>Level B</p> <p><b>Concept – Comparing and Ordering</b></p> <p><u>Skill – Locate numbers on a numberline</u><br/>Level A</p> |
| <p><u>Addition and Subtraction</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Combine groups to model addition</li> <li>Take part of a group away to model subtraction</li> <li>Compare groups to determine “how many more”</li> <li>Record additions and subtraction informally.</li> </ul>   | <p><b>Concept – Operations</b></p> <p><u>Skill – Introduce addition concretely...”in all” and “altogether”</u><br/>Level A</p> <p><u>Skill – Introduce addition concretely...”And”</u><br/>Level A</p> <p><u>Skill – Introduce subtraction concretely...”take away”</u><br/>Level A</p>  |
| <p><u>Multiplication and Division</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Model equal groups or rows</li> <li>Group and share collections of objects equally</li> <li>Record grouping and sharing informally</li> </ul>   | <p><b>Concept – Operation</b></p> <p><u>Skill – Introduce Multiplication Concretely</u><br/>Level C</p>  |
| <p><u>Fractions and Decimals.</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Divide an object into two equal parts</li> <li>Recognise and describe halves.</li> </ul>  | <p><b>Concept – Counting</b></p> <p><u>Skill – Introduce Fractions</u><br/>Level B (two Equal Parts)</p> <p><u>Skill – Introduce common fractions as parts of a whole</u> Level B (One half of a shape</p>   |

|  |   |
|--|---|
|  | and Cut in half worksheets # 1 and #2)  |
| <u>Patterns and Algebra</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Recognise, describe, create and continue repeating patterns</li> <li>• Continue simple number patterns that increase or decrease</li> <li>• Use the term “is the same as” to describe equality of groups</li> </ul>  | <b>Concept – Counting</b><br><u>Skill – skip counting and patterns</u><br>Level C (Patterns in a row worksheet #1 and #2) |
| <u>Data</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Collect data about students and their environment</li> <li>• Organise actual objects or pictures of the objects into a data display</li> <li>• Interpret data displays made from objects and pictures</li> </ul>   |   |
| <u>Length</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Identify and describe the attribute of length</li> <li>• Compare lengths directly by placing objects side-by-side and aligning the ends</li> <li>• Record comparisons informally.</li> </ul>   |   |
| <u>Area</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Identify and describe the attribute of an area</li> <li>• Estimate the larger of two areas and compare using direct comparison.</li> <li>• Record comparisons informally</li> </ul>  |   |
| <u>Volume and Capacity</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Identify and describe the attributes of volume and capacity</li> <li>• Compare the capacities of two containers using direct comparison</li> <li>• Compare the volumes of two objects by direct observation</li> <li>• Record comparisons informally</li> </ul> |   |
| <u>Mass</u>  |   |

|   |  |
|---|--|
| <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify and describe the attribute of mass</li> <li>• Compare the masses of two objects by pushing, pulling or hefting or using an equal arm balance</li> <li>• Record comparisons informally</li> </ul>   |  |
| <p><u>Time</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Describe the duration of events using everyday language.</li> <li>• Sequence events in times</li> <li>• Name days of the week and seasons</li> <li>• Tell time on the hour on digital and analog clocks</li> </ul>   | <p><b>Concept – Comparing and ordering</b><br/> <u>Skill – Understand Measurement of Time</u><br/> Level B (The clock Worksheets # 1 &amp; 2, and Times to the Hour worksheets #1 &amp; 2)</p> |
| <p><u>Three-dimensional Space</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Manipulate and sort three-dimensional objects found in the environment</li> <li>• Describe features of three-dimensional objects using everyday language</li> <li>• Use informal names for three-dimensional objects</li> </ul>                                       | <p><b>Concept – Counting</b><br/> <u>Skill – Recognize and count solids</u><br/> Level B</p>   |
| <p><u>Two-dimensional Space</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Manipulate, sort and describe two-dimensional shapes</li> <li>• Identify and name circles, squares, triangles and rectangles in pictures and the environment, and presented in different orientations</li> <li>• Identify and draw straight and curved lines</li> </ul> | <p><b>Concept – Counting</b><br/> <u>Skill – Recognise and count 2-D Figures</u><br/> Level B</p>  |
| <p><u>Position</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Give and follow simple directions</li> <li>• Use everyday language to describe position</li> </ul>   |  |

**Stage One  
(Year 1-2)**

| TOPIC  | RELEVANT EXERCISE   |
|--|---|
| <p><u>Whole Numbers</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Count forwards and backwards by ones, twos and fives.</li> <li>• Count forwards and backwards by tens, one and off the decade.</li> <li>• Read, order and represent two-digit numbers</li> <li>• Read and use the ordinal names to at least “Thirty-first”</li> <li>• Sort, order and count money using face value</li> <li>• Read, order and represent three-digit numbers</li> </ul> | <p><b>Concept – Counting</b></p> <p><u>Skill – Reading and printing numerals</u><br/>Level A, B and C</p> <p><u>Skill – counting backwards</u><br/>Level A and B</p> <p><u>Skill – Skip counting and patterns</u><br/>Level C</p> <p><u>Skill – Count on from a given number</u><br/>Level A</p> <p><u>Skill – Counting using money</u><br/>Level B, C and D</p> <p><b>Concept – Comparing and Ordering</b></p> <p><u>Skill – Use ordinal Numbers</u><br/>Level A and B</p> |
| <p><u>Addition and Subtraction</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Model addition and subtraction using concrete materials.</li> <li>• Develop a range of mental strategies and informal recording methods for addition and subtraction</li> <li>• Record number sentences using drawings, numerals, symbols and words</li> </ul>  | <p><b>Concept – Operations</b></p> <p><u>Skill – Introduce the symbolism # + # =</u><br/>Level A</p> <p><u>Skill – Introduce the words... ‘plus’ and ‘equals’</u><br/>Level A</p> <p><u>Skill – Demonstrate Addition facts... Making 5, 6, 7, 8, 9 and 10.</u><br/>Level A</p> <p><b>Concept – Comparing and Ordering</b></p> <p><u>Skill – Introduce “Greater than” “less than”</u><br/>Level A</p>  |
| <p><u>Multiplication and Division</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Rhythmic and skip count by ones, twos, fives and tens</li> <li>• Model and use strategies for multiplication including arrays, equal groups and repeated addition.</li> <li>• Model and use strategies for division including sharing, arrays and repeated subtraction</li> <li>• Record using drawing, numeral, symbols and words.</li> </ul>                           | <p><b>Concept – Counting</b></p> <p><u>Skill – Skip counting and patterns</u><br/>Level C</p> <p><u>Skill – Introduction to Arrays</u><br/>Level C</p> <p><u>Skill – Introduction to Division</u><br/>Level C</p> <p><b>Concept – operations</b></p> <p><u>Skill – Introduce Multiplication Concretely</u><br/>Level C</p> <p><u>Skill – Introduce Multiplication Sentences</u><br/>Level C</p>   |

|  |   |
|--|---|
|  | <u>Skill – Introduction to Arrays</u><br>Level C  |
| <u>Fractions and Decimals</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Model and describe a half or a quarter of a whole object</li> <li>• Model and describe a half or a quarter of objects</li> <li>• Use fraction notation and <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math>.</li> </ul>   | <b>Concept – Counting</b><br><u>Skill – Introduce Fractions...Equal Parts</u><br>Level B (all)<br><u>Skill – Introduce common fractions as parts of whole</u><br>Level B (One half of a shape, three quarters of a shape, cut in half worksheet #1 and 2) |
| <u>Chance</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Recognise the element of chance in familiar daily activities</li> <li>• Use familiar language to describe the element of chance</li> </ul>   | <b>Concept – Counting</b><br><u>Skill – Estimating the number of Objects and Reasonableness</u><br>Level A and B  |
| <u>Patterns and Algebra</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Create, represent and continue a variety of number patterns and supply missing elements</li> <li>• Use the equals sign to record equivalent number relationships</li> <li>• Build number relationships by relating addition and subtraction facts to at least 20</li> <li>• Make generalizations about number relationships</li> </ul> | <b>Concept – Problem solving</b><br><u>Skill – Find a Pattern</u><br>Lesson Johnny’s Pennies<br><u>Skill – Find a Pattern</u><br>Lesson Toy Animals   |
| <u>Data</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Gather and record data using tally marks</li> <li>• Display the data using concrete materials and pictorial representations.</li> <li>• Use objects or pictures as symbols to represent other objects, using one-to-one correspondence.</li> <li>• Interpret information presented in picture graphs and column graphs</li> </ul>                      | <b>Concept – Counting</b><br><u>Skill – 1 to 1 correspondence of # to objects</u><br>Level A<br><br><b>Concept – Operations</b><br><u>Skill – Given Graph...Perform operations</u><br>Level D   |
| <u>Length</u><br><i>Key Ideas:</i> <ul style="list-style-type: none"> <li>• Use informal units to estimate and</li> </ul>  |   |

|   |  |
|---|--|
| <p>measure length and distance by placing informal units end-to-end without gaps or overlaps</p> <ul style="list-style-type: none"> <li>• Record measurements by referring to the number and type of informal or formal units</li> <li>• Recognise the need for metres and centimeters, and use them to estimate and measure length and distance.</li> </ul>  |  |
| <p><u>Area</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use appropriate informal units to estimate and measure area.</li> <li>• Compare and order two or more areas</li> <li>• Record measurements by referring to the number and type of informal units used</li> </ul>  | <p><b>Concept – Operations</b><br/><u>Skill – Finding the Perimeter of a Shape</u><br/>Level C</p> <p><b>Concept – Operations</b><br/><u>Skill – Finding the Area of a Shape</u><br/>Level D</p> |
| <p><u>Volume and Capacity</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use appropriate informal units to estimate and measure volume and capacity</li> <li>• Compare and order the capacities of two or more containers and the volumes of two or more models or objects</li> <li>• Record measurements by referring to the number and type of informal units used</li> </ul> |  |
| <p><u>Mass</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Estimate and measure the mass of an object using an equal arm balance and appropriate informal units</li> <li>• Compare and order two or more objects according to mass</li> <li>• Record measurements by referring to the number and type of informal units used</li> </ul>  |  |

|   |   |
|---|---|
| <p><u>Time</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use informal units to measure and compare the duration of events</li> <li>• Name and order the months and seasons of the year</li> <li>• Identify the day and date on a calendar</li> <li>• Tell time on the hour and half-hour on digital and analog clocks</li> </ul>   | <p><b>Concept – Comparing and ordering</b><br/><u>Skill – Described elapsed Time..Hours, 5 minutes</u><br/>Level C</p> <p><b>Concept – Comparing and Ordering</b><br/><u>Skill – Understand Measurement of Time</u><br/>Level B</p> |
| <p><u>Three-Dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Name, describe, sort and model cones, cubes, cylinders, spheres and prisms</li> <li>• Recognise three-dimensional objects in pictures and the environment and presented in different orientations</li> <li>• Recognise that three-dimensional objects look different from different views.</li> </ul>  | <p><b>Concept – Counting</b><br/><u>Skill – Recognise and Count Solids</u><br/>Level B</p>  |
| <p><u>Two-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify, name, compare and represent hexagons, rhombuses and trapeziums presents in different orientations</li> <li>• Make tessellating designs using flips, slide and turns</li> <li>• Identify a line of symmetry</li> <li>• Identify and name parallel, vertical and horizontal lines</li> <li>• Identify corners as angles</li> <li>• Compare angles by placing one angle on top of another.</li> </ul> | <p><b>Concept – Counting</b><br/><u>Skill – Recognise and Count Two Dimensional Figures</u><br/>Level B</p>   |
| <p><u>Position</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Represent the position of objects using models and drawings</li> <li>• Describe the position of objects using everyday language, including ‘left’ and ‘right’.</li> </ul>   |   |

|  |  |
|--|--|
|  |  |
|--|--|

**Stage 2**  
**(Years 3-4)**  
*Using Understanding Numeration.*

| TOPIC  | RELEVANT EXERCISE  |
|--|--|
| <p><u>Whole numbers</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Uses place value to read, represent and order numbers up to four digits</li> <li>• Count forwards and backwards by tens or hundreds, on and off the decade</li> </ul>                                | <p><b>Concept – Place Value</b><br/> <u>Skill – Break numbers into Groups</u><br/> Level B and C<br/> <u>Skill – Model Numbers Grouped in Packages</u><br/> Level C<br/> <u>Skill – Identify Value Patterns (to 20)</u><br/> Level C<br/> <u>Skill – Identify Place value Patterns (to 100)</u><br/> Level C<br/> <u>Skill – Identify Place value Patterns (to 1000)</u><br/> Level C and D</p>  |
| <p><u>Addition and Subtraction</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Uses a range of mental strategies for addition and subtraction involving two-, three-, and four-digit numbers</li> <li>• Explain and record methods for adding and subtracting</li> </ul> | <p><b>Concept – Operations</b><br/> <u>Skill – Add 3 or 4 number</u><br/> Level A and B<br/> <u>Skill – Addition Strategies</u><br/> Level A, B and C<br/> <u>Skill – Add 2 Digit numbers...concretely</u><br/> Level C<br/> <u>Skill- Add 2 Digit Numbers...Abstractly</u><br/> Level C<br/> <u>Skill – Add 3 Digit Numbers..concretely</u><br/> Level D<br/> <u>Skill- Add 3 Digit numbers...Abstractly</u><br/> Level D<br/> <u>Skill- Fact Families...Add &amp; Subtract</u><br/> Level A, B and C<br/> <u>Skill- Subtract 2 Digit Numbers...concretely</u><br/> Level C<br/> <u>Skill- Subtract 2 digit Numbers...Abstractly</u><br/> Level C<br/> <u>Skill- Subtract 3 digit numbers...concretely</u><br/> Level D<br/> <u>Skill- subtract 3 digit numbers...abstractly</u><br/> Level D</p> |
| <p><u>Multiplication and Division</u><br/> <i>Key Ideas:</i></p>   | <p><b>Concept – Operations</b></p>   |

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Develop mental facility for number facts up to 10x10.</li> <li>• Find multiples and squares of numbers</li> <li>• Use mental and informal written strategies for multiplying or dividing a two-digit number by a one digit operator</li> <li>• Interpret remainders in division problems</li> <li>• Determine factors for a given number</li> </ul>   | <p><u>Skill – Introduce Multiplication Facts, 2, 3, 4, 5, and 6, 7, 8, 9.</u><br/>Level C and D<br/><u>Skill – Patterns in multiplication</u><br/>Level C and D<br/><u>Skill – Note patterns in 10 x 10 Multiplication tables.</u><br/>Level D<br/><u>Skill- add 3 or 4 numbers</u><br/>Level C (Magic Square)<br/><u>Skill – Introduce Multiplication by 1 and 0</u><br/>Level C<br/><u>Skill – Introduce division Facts 2, 3, 4, 5 and 6, 7, 8, 9.</u><br/>Level C and D</p> |
| <p><u>Fractions and Decimals</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Model, compare and represent fractions with denominators 2, 4 and 8, followed by fractions with denominators of 5, 10 and 100.</li> <li>• Model, compare and represent decimals to 2 decimal places</li> <li>• Perform calculations with money</li> <li>• Find equivalence between halves, quarters and eights; fifths and tenths; tenths and hundredths</li> <li>• Recognise percentages in everyday situations.</li> <li>• Relate a common percentage to a fraction or decimal.</li> </ul> | <p><b>Concept – Counting</b><br/><u>Skill- Introduce Fractions as Parts of A Whole.</u><br/>Level B and C<br/><u>Skill – Introduce Fractions of a set</u><br/>Level C<br/><u>Skill – Introduce decimals</u><br/>Level D<br/><u>Skill – Counting using money</u><br/>Level C and D</p>  |
| <p><u>Chance</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Explore all possible outcomes in a simple chance situation</li> <li>• Conduct simple chance experiments</li> <li>• Collect data and compare likelihood of events in different contexts</li> </ul>  |  |
| <p><u>Patterns and Algebra</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Generate, describe and record number patterns using a variety of strategies</li> <li>• Build number relationships by</li> </ul>  | <p><b>Concept – Operations</b><br/><u>Skill – Patterns in Multiplication</u><br/>Level C<br/><u>Skill – Note Patterns in 10X10 Multiplication Table</u></p>  |

|  |   |
|--|---|
| <p>relating multiplication and division facts to at least 10x10.</p> <ul style="list-style-type: none"> <li>• Complete simple number sentences by calculating the value of the missing number</li> </ul>   | <p>Level D</p> <p><b>Concept – Problem Solving</b><br/> <u>Skill – Number Sentence</u><br/> Lesson Oranges<br/> Lesson Bills Ball</p> |
| <p><u>Data</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Conduct surveys, classify and organize data using tables.</li> <li>• Construct vertical and horizontal column graphs and picture graphs</li> <li>• Interpret data presented in tables, column graphs and picture graphs</li> </ul> <p><u>Length</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Estimate, measure, compare and record lengths and distances using metres, centimetres and/or millimetres.</li> <li>• Estimate and measure the perimeter of two-dimensional shapes</li> <li>• Convert between metres and centimetres, and centimetres and millimetres.</li> <li>• Record lengths and distances using decimal notation to two places</li> </ul> | <p><b>Concept – Operations</b></p> <p><u>Skill – Given Graph... Perform Operations</u><br/> Level C</p>                               |
| <p><u>Area</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the need for square centimetres and square metres to measure area.</li> <li>• Estimate, measure, compare and record areas in square centimetres and square metres.</li> </ul>   | <p><b>Concept – Operations</b><br/> <u>Skill – Finding the area of a Shape</u><br/> Level D</p>                                       |
| <p><u>Volume and Capacity</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the need for a formal unit to measure volume and capacity</li> <li>• Estimate, measure, compare and record volumes and capacities using litres.</li> </ul>   |   |

|  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Measure the volume of models in cubic centimetres.</li> <li>• Estimate, measure, compare and record volumes and capacities using litres and millilitres</li> <li>• Convert between litres and millilitres.</li> </ul>   |   |
| <p><u>Mass</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the need for a formal unit to measure mass</li> <li>• Estimate, measure, compare and record masses using kilograms and grams</li> </ul>  |   |
| <p><u>Time</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the coordinated movements of the hands on a clock.</li> <li>• Read and record time using digital and analog notation</li> <li>• Convert between units of time</li> <li>• Read and interpret simple timetables, timelines and calendars.</li> </ul> | <p><b>Concept – Comparing and Ordering</b><br/><u>Skill – Understand Measurement of Time</u><br/>Level B, C and D<br/><u>Skill – Described Elapsed Time...Hours, 5 minutes</u><br/>Level C and D<br/><u>Skill – Describe Elapsed Time...Minutes</u><br/>Level D<br/><u>Skill – Describe Back in Time ...Hours, 5 minutes</u><br/>Level C and D<br/><u>Skill – Describe Back in Time...Minutes</u><br/>Level D</p> |
| <p><u>Three-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Name, describe, sort, make and sketch prisms, pyramids, cylinders, cones and spheres</li> <li>• Create nets from everyday packages.</li> <li>• Describe cross-sections of three-dimensional objects.</li> </ul>                           | <p><b>Concept – Counting</b><br/><u>Skill – Recognise and Count Solids</u><br/>Level B</p>  |
| <p><u>Two-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify and name pentagons, octagons and parallelograms presents in different orientations</li> <li>• Compare and describe special</li> </ul>  |   |

|  |  |
|--|--|
| <p>groups of quadrilaterals.</p> <ul style="list-style-type: none"><li>• Make tessellating designs by reflecting, translating and rotating</li><li>• Find all lines of symmetry for a two dimensional shape</li><li>• Recognise opening, slopes and turns as angles</li><li>• Describe angles using everyday language and the term ‘right’</li><li>• Compare angles using informal means</li></ul> |  |
| <p><u>Position</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Use simple maps and grids to represent position and follow routes.</li><li>• Determine the directions N, S, E and W; NE, NW, SE and SW, given one of the directions</li><li>• Describe the location of an object on a simple map using coordinates or directions.</li></ul>                                   |  |

**Stage 2**  
**(years 3-4)**  
*Using Understanding Maths*

|   |   |
|---|---|
| <p><u>Whole numbers</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Uses place value to read, represent and order numbers up to four digits</li> <li>• Count forwards and backwards by tens or hundreds, on and off the decade</li> </ul>   | <p><b>Understanding Whole Numbers and Integers</b></p> <p><u>1) The meaning of whole Numbers.</u></p>   |
| <p><u>Addition and Subtraction</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Uses a range of mental strategies for addition and subtraction involving two-, three-, and four-digit numbers</li> <li>• Explain and record methods for adding and subtracting</li> </ul>  | <p><b>Understanding Whole Numbers and Integers</b></p> <p><u>2) Adding and Subtracting Whole Numbers</u></p>  |
| <p><u>Multiplication and Division</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Develop mental facility for number facts up to 10x10.</li> <li>• Find multiples and squares of numbers</li> <li>• Use mental and informal written strategies for multiplying or dividing a two-digit number by a one digit operator</li> <li>• Interpret remainders in division problems</li> <li>• Determine factors for a given number</li> </ul> | <p><b>Understanding Whole Numbers and Integers</b></p> <p><u>3) Multiplying and Dividing Whole Numbers</u></p> <p>Multiplication facts<br/>Commutative Property<br/>The 10 x 10 Multiplication Table<br/>Multiply by a Single Digit Multiplier<br/>Divide by a Single Divisor</p> <p><b>Understanding Fractions</b></p> <p><u>2) The multiplication Table</u></p> |
| <p><u>Fractions and Decimals</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Model, compare and represent fractions with denominators 2, 4 and 8, followed by fractions with denominators of 5, 10 and 100.</li> <li>• Model, compare and represent decimals to 2 decimal places</li> <li>• Perform calculations with money</li> <li>• Find equivalence between halves,</li> </ul>  | <p><b>Understanding Fractions</b></p> <p>1) <u>The Meaning of Fractions</u><br/>4) <u>Percent... A Special Fraction</u><br/>5) <u>Introduction to decimals.</u><br/>6) <u>Percents...Fractions...Decimals</u></p> <p><b>Understanding Percent</b></p> <p>1) <u>The meaning of Percent</u><br/>2) <u>Percent to Fraction/Decimal</u></p>                           |

|  |  |
|--|--|
| <p>quarters and eighths; fifths and tenths; tenths and hundredths</p> <ul style="list-style-type: none"> <li>• Recognise percentages in everyday situations.</li> <li>• Relate a common percentage to a fraction or decimal.</li> </ul>  |  |
| <p><u>Chance</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Explore all possible outcomes in a simple chance situation</li> <li>• Conduct simple chance experiments</li> <li>• Collect data and compare likelihood of events in different contexts</li> </ul>  | <p><b>Understanding Probability</b></p> <ol style="list-style-type: none"> <li>1) <u>Introduction to Probability</u></li> <li>2) <u>What's the Chance</u></li> <li>3) <u>Dice Probabilities</u></li> </ol> |
| <p><u>Patterns and Algebra</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Generate, describe and record number patterns using a variety of strategies</li> <li>• Build number relationships by relating multiplication and division facts to at least 10x10.</li> <li>• Complete simple number sentences by calculating the value of the missing number</li> </ul> |  |
| <p><u>Data</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Conduct surveys, classify and organize data using tables.</li> <li>• Construct vertical and horizontal column graphs and picture graphs</li> <li>• Interpret data presented in tables, column graphs and picture graphs</li> </ul>   | <p><b>Understanding Graphing</b></p> <ol style="list-style-type: none"> <li>1) <u>Reading and Sketching Graphs</u></li> <li>2) <u>Statistics</u></li> </ol>  |
| <p><u>Length</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Estimate, measure, compare and record lengths and distances using metres, centimetres and/or millimetres.</li> <li>• Estimate and measure the perimeter of two-dimensional shapes</li> <li>• Convert between metres and centimetres, and centimetres and</li> </ul>                                    | <p><b>Understanding Measurement</b></p> <ol style="list-style-type: none"> <li>1) <u>An Introduction to Measurement</u></li> <li>2) <u>Perimeter and area of polygons</u></li> </ol>                       |

|   |   |
|---|---|
| <p>millimetres.</p> <ul style="list-style-type: none"> <li>Record lengths and distances using decimal notation to two places</li> </ul>   |   |
| <p><u>Area</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Recognise the need for square centimetres and square metres to measure area.</li> <li>Estimate, measure, compare and record areas in square centimetres and square metres.</li> </ul>   | <p><b>Understanding Measurement</b><br/>2) <u>Perimeter and area of Polygons</u></p>  |
| <p><u>Volume and Capacity</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Recognise the need for a formal unit to measure volume and capacity</li> <li>Estimate, measure, compare and record volumes and capacities using litres.</li> <li>Measure the volume of models in cubic centimetres.</li> <li>Estimate, measure, compare and record volumes and capacities using litres and millilitres</li> <li>Convert between litres and millilitres.</li> </ul> | <p><b>Understanding Measurement</b><br/>3) <u>Solids...Volume and Surface Area</u><br/>Classifying Solids<br/>Volume of a Solid</p> |
| <p><u>Mass</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Recognise the need for a formal unit to measure mass</li> <li>Estimate, measure, compare and record masses using kilograms and grams</li> </ul>   |   |
| <p><u>Time</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>Recognise the coordinated movements of the hands on a clock.</li> <li>Read and record time using digital and analog notation</li> <li>Convert between units of time</li> <li>Read and interpret simple timetables, timelines and calendars.</li> </ul>  |   |

|  |  |
|--|--|
| <p><u>Three-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Name, describe, sort, make and sketch prisms, pyramids, cylinders, cones and spheres</li> <li>• Create nets from everyday packages.</li> <li>• Describe cross-sections of three-dimensional objects.</li> </ul>   | <p><b>Understanding Measurement</b><br/>4) <u>Solids...Volume and Surface Area</u><br/>Classifying Solids</p>  |
| <p><u>Two-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify and name pentagons, octagons and parallelograms presents in different orientations</li> <li>• Compare and describe special groups of quadrilaterals.</li> <li>• Make tessellating designs by reflecting, translating and rotating</li> <li>• Find all lines of symmetry for a two dimensional shape</li> <li>• Recognise opening, slopes and turns as angles</li> <li>• Describe angles using everyday language and the term ‘right’</li> <li>• Compare angles using informal means</li> </ul> | <p><b>Understanding Measurement</b><br/>3) <u>Perimeter and Area of Polygons</u><br/>Polygons...What are they?<br/>4) <u>Angles and their measure</u></p> <p><b>Understanding Graphing</b><br/>4) <u>Transformations</u><br/>Line of Symmetry – An Introduction<br/>Symmetry Match<br/>Tessellations</p> |
| <p><u>Position</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use simple maps and grids to represent position and follow routes.</li> <li>• Determine the directions N, S, E and W; NE, NW, SE and SW, given one of the directions</li> <li>• Describe the location of an object on a simple map using coordinates or directions.</li> </ul>   |  |

**Stage 3  
(Years 5-6)**

|              |                          |
|--------------|--------------------------|
| <b>TOPIC</b> | <b>RELEVANT EXERCISE</b> |
|--------------|--------------------------|

|   |   |
|---|---|
| <p><u>Whole Numbers</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Read, write and order numbers of any size using place value</li> <li>• Record numbers in expanded notation</li> <li>• Recognise the location of negative numbers in relation to zero</li> <li>• Identify differences between Roman and Hindu-Arabic counting systems</li> </ul>   | <p><b>Understanding Whole Numbers and Integers</b></p> <p>1) <u>The meaning of Whole Numbers</u></p> <p>4) <u>The meaning of Integers</u></p>   |
| <p><u>Addition and Subtraction</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Select and apply appropriate mental, written or calculator strategies for addition and subtraction with counting numbers of any size</li> </ul>  | <p><b>Understanding Whole Numbers and Integers</b></p> <p>2) <u>Adding and Subtracting Whole Numbers.</u></p>   |
| <p><u>Multiplication and Division</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Select and apply appropriate mental, written or calculator strategies for multiplication and division</li> <li>• Use formal written algorithms for multiplication (limit operators to two-digit numbers) and division (limit operators to single digits)</li> <li>• Explore Prime and composite numbers</li> </ul>                      | <p><b>Understanding Whole numbers and Integers</b></p> <p>1) <u>Multiplying and Dividing whole numbers.</u></p> <p><b>Understanding Algebra</b></p> <p>3) <u>Patterns, Patterns Patterns</u><br/>Prime and composite</p>  |
| <p><u>Fractions and Decimals</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Model, compare and represent commonly used fractions (those with denominators 2,3,4,5,6,8,10,12 and 100)</li> <li>• Find equivalence between thirds, sixths and twelfths</li> <li>• Express a mixed numeral as an improper fraction and vice versa.</li> <li>• Multiply and divide decimals by whole numbers in everyday contexts</li> </ul> | <p><b>Understanding Fractions</b></p> <p>8) <u>Adding Fractions</u></p> <p>9) <u>Subtracting Fractions</u></p> <p>10) <u>Multiplying fractions</u></p> <p>13) <u>Improper Fractions and Mixed Numbers</u><br/>The Concept<br/>Improper Fractions and Mixed Numbers...What are they.<br/>Introductory Problem<br/>Mixed to Improper<br/>Improper to Mixed.</p> <p>14) <u>Addition and Subtraction of Decimals.</u></p> |

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Add and subtract decimals to three decimal places</li> <li>• Add and subtract simple fractions where one denominator is a multiple of the other</li> <li>• Multiply simple fractions by whole numbers</li> <li>• Calculate unit fractions of a number</li> <li>• Calculate simple percentages of quantities</li> <li>• Apply the four operations to money in real life situations</li> </ul> | <p><u>15) Multiplication and Division of Decimals.</u><br/> Recall the basics<br/> Multiply by repeated addition<br/> Special case: Multiply by a whole number.</p> <p><b>Understanding Percent</b><br/> <u>5) Percent of a number.</u></p> |
| <p><u>Chance</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Assign numerical values to the likelihood of simple events occurring</li> <li>• Order the likelihood of simple events on a number line from 0 to 1</li> </ul>  | <p><b>Understanding Probability</b></p> <ol style="list-style-type: none"> <li>1) <u>Introduction to Probability</u></li> <li>2) <u>What's the chance</u></li> <li>3) <u>Dice Probabilities.</u></li> </ol>                                 |
| <p><u>Patterns and Algebra</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Build simple geometric patterns involving multiples</li> <li>• Complete a table of values for geometric and number patterns</li> <li>• Describe a pattern in words in more than one way</li> <li>• Construct, verify and complete number sentences involving the four operations with a variety of numbers</li> </ul>              | <p><b>Understanding Algebra</b><br/> <u>3) Patterns Patterns Patterns.</u></p>  |
| <p><u>Data</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Determine the mean (average) for a small set of data</li> <li>• Draw picture, column, line and divided bar graphs using scales on many-to-one correspondence</li> <li>• Read and interpret sector (pie) graphs</li> <li>• Read and interpret graphs with scaled of many-to-one correspondence</li> </ul>   | <p><b>Understanding Graphs</b></p> <ol style="list-style-type: none"> <li>1) <u>Reading and Sketching Graphs</u></li> <li>2) <u>Statistics</u></li> </ol>   |

|  |  |
|--|--|
| <p><u>Length</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Select and use the appropriate unit and device to measure lengths, distances and perimeters</li> <li>• Convert between metres and kilometres; millimetres, centimetres and metres.</li> <li>• Record lengths and distances using decimal notation to three places</li> <li>• Calculate and compare perimeters of squares, rectangles and equilateral and isosceles triangles.</li> </ul> | <p><b>Understanding Measurement and Geometry</b></p> <ol style="list-style-type: none"> <li>1) <u>An introduction to measurement</u><br/>Converting between metric units.</li> <li>2) <u>Perimeter and Area of Polygons</u></li> </ol> |
| <p><u>Area</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Select and use the appropriate unit to calculate area</li> <li>• Recognise the need for square kilometres and hectares</li> <li>• Develop formulae in words for finding areas of squares, rectangles and triangles</li> </ul>  | <p><b>Understanding Measurement and Geometry</b></p> <ol style="list-style-type: none"> <li>2) <u>Perimeter and Area of Polygons</u></li> </ol>  |
| <p><u>Volume and Capacity</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the need for cubic metres</li> <li>• Estimate and measure the volume of rectangular prisms</li> <li>• Select the appropriate unit to measure volume and capacity</li> <li>• Determine the relationship between cubic centimetres and millilitres.</li> <li>• Record volume and capacity using decimal notation to three decimal places</li> </ul>                 | <p><b>Understanding Measurement and Geometry</b></p> <ol style="list-style-type: none"> <li>4) <u>Solids...Volume and Surface Area</u></li> </ol>  |

|  |  |
|--|--|
| <p><u>Mass</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Recognise the need for tonnes</li> <li>• Convert between kilograms and grams and between kilograms and tonnes</li> <li>• Select and use the appropriate unit and device to measure mass</li> <li>• Record mass using decimal notation to three decimal places</li> </ul>   |  |
| <p><u>Time</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Convert between am/pm notation and 24-hour time</li> <li>• Compare various time zones in Australia, including during daylight saving</li> <li>• Draw and interpret a timeline using a scale</li> <li>• Use timetables involving 24-hour time</li> </ul>  |  |
| <p><u>Three-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify three-dimensional objects, including particular prisms and pyramids, on the basis of their properties</li> <li>• Construct three dimensional models given drawings of different views.</li> </ul>  | <p><b>Understanding Measurement and Geometry</b><br/>8) <u>Projective Geometry</u></p>   |
| <p><u>Two-dimensional Space</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Identify right-angled, isosceles, equilateral and scalene triangles</li> <li>• Identify and draw regular and irregular two-dimensional shapes</li> <li>• Identify and name parts of a circle</li> <li>• Enlarge and reduce shapes, pictures and maps</li> <li>• Identify shapes that have rotational symmetry</li> <li>• Classify angles as right, acute, obtuse, reflex, straight or a revolution</li> </ul> | <p><b>Understanding Measurement and Geometry</b><br/>4) <u>Angles and their Measure</u><br/>5) <u>Angles and Polygons.</u></p> |

|  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Measure in degrees and construct angles using a protractor.</li></ul>  |  |
| <p><u>Position</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Interpret scales on maps and plans</li><li>• Make simple calculations using scale</li></ul> |  |

**Stage Four**

(Years 7-8)

| TOPIC  | RELEVANT EXERCISES  |
|--|---|
| <p><u>Operations with Whole Numbers</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Explore other counting systems</li><li>• Investigate groups of positive whole numbers</li><li>• Determine and apply tests of divisibility</li><li>• Express a number as a product of its prime factors</li><li>• Find squares/related square roots; cubes/related cube roots</li><li>• Use index notation for positive integral indices</li><li>• Apply mental strategies to aid computation</li><li>• Divide two or three-digit numbers by a two-digit number</li></ul> | <p><b>Understanding Exponents:</b></p> <ol style="list-style-type: none"><li>1) <u>The meaning of Exponents</u></li><li>5) <u>Square root</u></li></ol>   |
| <p><u>Integers</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Perform operations with directed numbers</li><li>• Simplify expressions involving grouping symbols and apply order of operations</li></ul>  | <p><b>Understanding Whole Numbers and Integers</b></p> <ol style="list-style-type: none"><li>5) <u>Adding Integers</u></li><li>6) <u>Subtracting Integers</u></li><li>7) <u>Multiplying integers</u></li><li>8) <u>Dividing Integers</u></li><li>9) <u>Order of Operations</u></li></ol>  |
| <p><u>Fractions, Decimals and percentages</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Perform operations with Fractions, Decimals and mixed numerals</li><li>• Use ratios and rates to solve problems</li></ul>  | <p><b>Understanding Fractions:</b></p> <ol style="list-style-type: none"><li>7) <u>Ratios and Proportions</u></li><li>8) <u>Adding Fractions</u></li><li>9) <u>Subtracting Fraction</u></li><li>10) <u>Multiplying Fractions</u></li><li>11) <u>Dividing Fractions</u></li><li>12) <u>Order of Operations</u></li><li>13) <u>Improper Fractions and Mixed Numbers</u></li><li>14) <u>Numbers</u></li><li>15) <u>Addition and Subtraction of Decimals</u></li><li>16) <u>Multiplication and Division of Decimals</u></li></ol> |
| <p><u>Probability</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"><li>• Determine the probability of simple events</li></ul>   | <p><b>Understanding Probability:</b></p> <ol style="list-style-type: none"><li>4) <u>Binomial Probabilities</u></li><li>5) <u>Geometric probabilities</u></li></ol>   |

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Solve simple probability problems</li> <li>• Recognise complementary events</li> </ul>  |  |
| <p><u>Algebraic Techniques</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use letters to represent numbers</li> <li>• Translate between words and algebraic symbols and between algebraic symbols and words</li> <li>• Recognise and use simple equivalent algebraic expressions</li> <li>• Use the algebraic symbol system to simplify, expand and factorise simple algebraic expressions</li> <li>• Substitute into algebraic expressions</li> <li>• Solve linear equations and word problems using algebra</li> <li>• Solve simple inequalities</li> </ul> | <p><b>Understanding Algebra:</b></p> <ol style="list-style-type: none"> <li>1) <u>Introduction to Algebraic thinking</u></li> <li>2) <u>Tiles and algebra</u></li> <li>3) <u>Patterns, Patterns, Patterns</u></li> <li>4) <u>Patterns, Formulas, Substitution</u></li> <li>5) <u>Adding expression</u></li> <li>6) <u>Subtracting Expressions</u></li> <li>7) <u>Multiplying expressions</u></li> <li>8) <u>Factorising expressions</u></li> <li>9) <u>Dividing Expressions</u></li> </ol> |
| <p><u>Number Patterns</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Create, record and describe number patterns using words</li> <li>• Use algebraic symbols to translate descriptions of number patterns</li> <li>• Represent number pattern relationships as points on a grid</li> </ul>   | <p><b>Understanding Graphing:</b></p> <ol style="list-style-type: none"> <li>3) <u>Points on a grid</u></li> </ol>   |
| <p><u>Linear Relationships</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Interpret the number plane and locate ordered pairs</li> <li>• Graph and interpret linear relationships created from simple number patterns and equations</li> </ul>  | <p><b>Understanding Graphing:</b></p> <ol style="list-style-type: none"> <li>6) <u>Linear Relations</u></li> </ol>   |
| <p><u>Data Representation</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Draw, read and interpret graphs (line, sector, travel, step, conversion, divided bar, dot plots and stem and leaf plots), tables and charts</li> <li>• Distinguish between types of</li> </ul>   | <p><b>Understanding Graphing:</b></p> <ol style="list-style-type: none"> <li>2) <u>Statistics</u></li> </ol>   |

|  |   |
|--|---|
| <p>variables used in graphs</p> <ul style="list-style-type: none"> <li>• Identify misrepresentation of data in graphs</li> <li>• Construct frequency tables</li> <li>• Draw frequency histograms and polygons</li> </ul>   |   |
| <p><u>Data Analysis and Evaluation</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use sampling and census</li> <li>• Make predictions from samples and diagrams</li> <li>• Analyse data using mean, mode and range</li> </ul>  | <p><b>Understanding Graphing:</b><br/>2) <u>Statistics</u><br/>5) <u>Relations, Equations and Functions</u></p>                                       |
| <p><u>Perimeter and Area</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Describe the limits of accuracy of measuring instruments</li> <li>• Develop formulae and use to find the area and perimeter of triangle, rectangles and parallelograms</li> <li>• Find the areas of simple composite figures</li> <li>• Apply Pythagoras theorem</li> <li>• Investigate and find the area and circumference of circles</li> <li>• Convert between metric units of length and area</li> </ul> | <p><b>Understanding Exponents:</b><br/>6) <u>Pythagoras Theorem</u></p> <p><b>Understanding Measurement and Geometry</b><br/>2) <u>The circle</u></p> |
| <p><u>Surface Area and Volume</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Find the surface area of rectangular and triangular prisms</li> <li>• Find the volume of right prisms and cylinders</li> <li>• Convert metric units of volume</li> </ul>  | <p><b>Understanding Measurement and Geometry:</b><br/>4) <u>Solids... Volume and Surface Area.</u></p>  |
| <p><u>Time</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Perform operations involving time units</li> <li>• Use international time zones to compare times</li> <li>• Interpret a variety of tables and charts related to time</li> </ul>  |   |

|  |   |
|--|---|
| <p><u>Properties of Solids</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Determine properties of three-dimensional objects</li> <li>• Investigate platonic solids</li> <li>• Investigate Euler’s relationship for convex polyhedra</li> <li>• Make isometric drawings</li> </ul>   |   |
| <p><u>Angles</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Classify angles and determine angle relationships</li> <li>• Construct parallel and perpendicular lines and determine associated angle properties</li> <li>• Complete simple numerical exercises based on geometrical properties</li> </ul>   | <p><b>Understanding Measurement and Geometry:</b></p> <ul style="list-style-type: none"> <li>5) <u>Angles and their measure</u></li> <li>6) <u>Angles and Polygons</u></li> </ul> |
| <p><u>Properties of Geometrical Figures</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Classify, construct and determine properties of triangles and quadrilaterals</li> <li>• Complete simple numerical exercises based on geometrical properties</li> <li>• Identify congruent figures</li> <li>• Investigate similar figures and interpret and construct scale drawings</li> </ul> | <p><b>Understanding Measurement and Geometry:</b></p> <ul style="list-style-type: none"> <li>9) <u>Ratios for areas and volume</u></li> </ul>                                     |

|   |   |
|---|---|
| <p><u>Rational Numbers</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Define and use zero index and use zero index and negative integral indices</li> <li>• Develop the index laws arithmetically</li> <li>• Use index notation for square and cube roots</li> <li>• Express numbers in scientific notations (positive and negative powers of 10)</li> <li>• Express recurring decimals as fractions</li> <li>• Round number to a specified number of significant figures</li> <li>• Convert rates from one set of units to another</li> </ul> |   |
| <p><u>Real Numbers</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use integers and fractions for index notation</li> <li>• Define the system of real numbers distinguishing between rational and irrational numbers.</li> <li>• Perform operation with surds</li> <li>• Convert between surd and index form</li> </ul>   |   |
| <p><u>Consumer Arithmetic</u><br/> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Solve simple consumer problems including those involving earning and spending money</li> <li>• Calculate simple interest and find compound interest using a calculator and table to values</li> <li>• Use compound interest formula</li> <li>• Solve consumer arithmetic problems involving compound interest, depreciation, successive discounts.</li> </ul>   | <p><b>Understanding Percent:</b><br/> 7) <u>Percent in Business</u></p> |
| <p><u>Probability</u><br/> <i>Key Ideas:</i></p>  | <p><b>Understanding Probability:</b></p>                                |

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Determine relative frequencies to estimate probabilities</li> <li>• Determine theoretical probabilities</li> <li>• Solve probability problems including two-stage and compound events</li> </ul>   | <ul style="list-style-type: none"> <li>6) <u>Pascal's Triangle</u></li> <li>7) <u>Independent Events</u></li> <li>8) <u>Dependent Events</u></li> </ul> |
| <p><u>Algebraic Techniques</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Apply the index laws to simplify algebraic expressions (positive integral indices only)</li> <li>• Simplify, expand and factorise algebraic expressions including those involving fractions or with negative and/or fractional indices</li> <li>• Solve linear and simple quadratic equations of the form <math>ax^2=c</math></li> <li>• Solve quadratic equations by factoring, completing the square or using the quadratic formula.</li> <li>• Solve linear inequalities</li> <li>• Solve simultaneous equations using graphical and analytical methods for simple examples</li> <li>• Use algebraic techniques to simplify expressions, expand binomial products and factorise quadratic expressions</li> <li>• Solve simple inequalities</li> <li>• Solve a range of inequalities and rearrange literal equations</li> <li>• Solve simultaneous equations including quadratic equations</li> </ul> | <p><b>Understanding Graphing:</b><br/>10) <u>Quadratic Functions</u></p> <p><b>Solving Equations:</b><br/>7) <u>Solving Inequalities</u></p>            |
| <p><u>Coordinate Geometry</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use a diagram to determine midpoint, length and gradient of an interval joining two points on a number plane</li> <li>• Graph linear and simple non linear relationships from equations</li> <li>• Use distance, gradient and midpoint formulae</li> <li>• Apply the gradient/intercept form to</li> </ul>   | <p><b>Understanding Graphing:</b><br/>7) <u>Slope of a line</u><br/>8) <u>Equations of a straight Line</u><br/>9) <u>Quadratic Functions</u></p>        |

|  |  |
|--|--|
| <p>interpret and graph straight lines</p> <ul style="list-style-type: none"> <li>• Draw and interpret graphs including simple parabolas and hyperbolas</li> <li>• Use and apply various standard forms of the equation for a straight line, and graph regions on the number plane</li> <li>• Draw and interpret a variety of graphs including parabolas, cubics, exponentials and circles</li> <li>• Solve coordinate geometry problems</li> </ul> |  |
| <p><u>Graphs of Physical Phenomena</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Draw and interpret graphs of physical phenomena</li> <li>• Analyse and describe graphs of physical phenomena</li> </ul>  |  |
| <p><u>Curve sketching and polynomials</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Sketch a range of polynomials</li> <li>• Add, subtract, multiply and divide polynomials</li> <li>• Apply the factor and remainder theorem</li> </ul>  |  |
| <p><u>Functions and Logarithms</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Define functions</li> <li>• Use function notation</li> <li>• Determine inverse functions</li> <li>• Establish and apply the laws of logarithms</li> </ul>  | <p><b>Understanding Graphing:</b><br/>5) <u>Relations, Equations and Functions</u></p> |
| <p><u>Data Representation and Analysis</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Construct frequency tables for grouped data</li> <li>• Find mean and modal class for grouped data</li> <li>• Find median using a cumulative frequency table or polygon</li> </ul>  |  |
| <p><u>Data Analysis and Evaluation</u></p>   |  |

|   |  |
|---|--|
| <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Determine the upper and lower quartiles of a set of scores</li> <li>• Construct and interpret box and whiskers plots</li> <li>• Find the standard deviation of a set of scores using a calculator</li> <li>• Use the terms ‘skew’ and ‘symmetrical’ to describe the shapes of a distribution.</li> </ul>  | <p><b>Understanding Graphing</b><br/>2) <u>Statistics</u></p>  |
| <p><u>Perimeter and Area</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Develop formulae and use to find the area of rhombuses, trapeziums and kites</li> <li>• Find the area and perimeter of simple composite figures consisting of two shapes including quadrants and semicircles</li> <li>• Find area and perimeter of more complex figures</li> </ul>                                 |  |
| <p><u>Surface Area and Volume</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Find surface area of cylinders and composite solids</li> <li>• Find the volume of pyramids, cones, spheres and composite solids</li> <li>• Apply formulae for the surface area of pyramids, right cones and spheres</li> <li>• Explore and use similarity relationships for area and volume</li> </ul>        | <p><b>Understanding Measurement and Geometry:</b><br/>3) <u>Solids... Volume and Surface Area</u><br/>9) <u>Ratios for areas and volumes</u></p> |
| <p><u>Trigonometry</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use trigonometry to find sides and angles in right-angled triangles</li> <li>• Solve problems involving angles of elevation and angles of depression from diagrams</li> <li>• Solve further trigonometry problems including those involving three-figure bearing</li> <li>• Determine the exact trigonometric</li> </ul> |  |

|   |  |
|---|--|
| <p>ratios for <math>30^\circ</math>, <math>45^\circ</math>, <math>60^\circ</math></p> <ul style="list-style-type: none"> <li>• Apply relationships in trigonometry for complementary angles and tan in terms of sin and cos</li> <li>• Determine trigonometric ratios for obtuse angles</li> <li>• Sketch sine and cosine curves</li> <li>• Explore trigonometry with non-right-angled triangles: sine rule, cosine rule and area rule</li> <li>• Solve problems involving more than one triangle using trigonometry</li> </ul> |  |
| <p><u>Properties of Geometrical Figures</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Verify the properties of special quadrilaterals using congruent triangles</li> <li>• Identify similar triangles and describe their properties</li> <li>• Apply tests for congruent triangles</li> <li>• Use simple deductive reasoning in numerical and non-numerical problems</li> <li>• Establish sum of exterior angles result and sum of interior angles result for polygons</li> </ul>                      |  |
| <p><u>Deductive Geometry</u><br/><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Use deductive geometry to prove properties of special triangles and quadrilaterals</li> <li>• Construct geometrical arguments using similarity tests for triangles</li> <li>• Construct proofs of geometrical relationships involving congruent or similar triangles</li> </ul>   |  |
| <p><u>Circle Geometry</u><br/><i>Key Ideas:</i><br/>Deduce chord, angle, tangent and secant properties of circles</p>   |  |