

Western Australia

Early Childhood  
(Kindergarten to Year 3)

TOPIC	RELEVANT EXERCISES
<p><u>Numbers</u> <i>Students learn:</i></p> <ul style="list-style-type: none"> <li>To read, write and say whole numbers. They should be able to use them to count order and combine.</li> <li>Through the understanding numbers, children should be able to learn the sequence of number names and how to use the sequence to determine “how many” there are in a collection and to make a collection of a given size.</li> <li>An understanding of basic addition and subtraction facts.</li> <li>Gain experience in splitting quantities into “fair shares” and being to develop link between sharing and language of fractions</li> <li>Question and understand that a collection only has one count and that you can tell from the count alone which one has more (i.e. a collection of 24 objects always has one more than a collection of 23)</li> <li>To physically partition quantities so they can learn to think of numbers as compositions of other numbers i.e. 7 is composed of 1 and 6 or with 2 and 5 or 3 and 4.</li> </ul>	<p><b>Concept – Counting</b> <u>Skill – Reading and printing numerals:</u> Level A, B and C <u>Skill – Counting Backwards:</u> Level A and B <u>Skill – counting using money:</u> Level B, C and D</p> <p><b>Concept – Operations</b> <u>Skill – Introduce Addition:</u> Level A <u>Skill - Introduce the words “plus” and “equals”</u> Level A <u>Skills – Demonstrate addition facts (Making 5-10):</u> Level A <u>Skill – Introduce subtraction concretely ... “take away”</u> Level A <u>Skill - Fact Families - Add &amp; Subtract</u> Level A, B and C</p> <p><b>Concept – Counting</b> <u>Introduce Fractions...Equal parts</u> Level B <u>Introduce common Fractions as Parts of a Whole:</u> Level B and C</p> <p><b>Concept – Place value</b> <u>Skill – Break numbers into Groups.</u> Level B and C. <b>Concept – Place Value</b> <u>Skill – Identify place Value patterns (to 20 and to 100):</u> Level C</p>

<p><u>Measurement</u> <i>Students learn:</i></p> <ul style="list-style-type: none"> <li>• To understand intuitive notions of “more”, “less”, “equal amounts” and “big” and “small”.</li> <li>• Attributes of objects and events such as length, mass, capacity, area and time and to compare and order by particular attributes</li> <li>• Develop comparative language such as “heavier” and “lighter” and learn to compare quantities.</li> <li>• To estimate, i.e. how many matches in a box and hold it to estimate how heavy it is.</li> <li>• To use language such as “almost”, “about” and “just under” and begin to develop a feel for the size of centimetres and metres.</li> <li>• A basic understanding of scale i.e. that is chair is too big for the baby bear.</li> </ul>	<p><b>Concept – Comparing and Ordering</b> <u>Skill – Understand “more” and “less”</u> Level A</p> <p><b>Concept – Comparing and Ordering</b> <u>Skill – described elapsed time:</u> Level C and C</p> <p><u>Skill – Understand Measurement of time:</u> Level B, C and D</p> <p><b>Concept – comparing and Ordering</b> <u>Skill – Introduce “Greater Than”, “less than”:</u> Level A and C</p> <p><u>Skill – working with Whole Numbers <math>&gt;</math>, <math>&lt;</math>, <math>=</math>:</u> Level A, B, C and D</p> <p><b>Concept – Counting</b> <u>Skill – Estimating the number of Objects and Reasonableness:</u> Level A and B</p>
<p><u>Chance and Data</u> <i>Students Learn:</i></p> <ul style="list-style-type: none"> <li>• To investigate actions and events which involve unpredictability and learn about probability. They refine the use of everyday language of chance such as “will”, “won’t”, “possible/impossible” and “certain”.</li> <li>• To carry out experiments which involve chance processes e.g. selecting a jelly bean from a bowl with their eyes shut.</li> <li>• To classify consistently and to classify things in different ways e.g. collecting information on “the most popular kind of toys” etc</li> <li>• To record and represent data which arise from practical and problems solving activities.</li> <li>• To begin to construct graphs based mostly on one to one correspondence.</li> </ul>	<p><b>Concept – Problem Solving</b> Strategies <u>Skill-Make a Graph:</u> Lesson Animals <u>Skill-Make a table:</u> Lesson Muffins <u>Skill-Make a graph:</u> Classroom shoes.</p>

<p><u>Space</u> <i>Students learn:</i></p> <ul style="list-style-type: none"> <li>• To use a variety of materials to make and arrange things to model their real or imaginary world, learning 2D etc.</li> <li>• To investigate the connection between shape and function i.e. why does a bicycle have round wheels?</li> <li>• To handle objects and describe them in everyday language of shape, making statements such as “this box has eight corners, its sides are all square.”</li> <li>• To carry out changes to shape, size or position of objects and observe the effects.</li> <li>• Basic mathematical ideas about location and arrangement should be developed.</li> </ul>	<p><b>Concept – Counting</b> <u>Skill - Recognize and count solids:</u> Level B and C <u>Skill – Recognize and count Two dimensional figures:</u> Level B and C</p>
<p><u>Algebra</u> <i>Students learn:</i></p> <ul style="list-style-type: none"> <li>• To observe patterns and represent and describe there regularities in Mathematical Ways.</li> <li>• To develop Algebraic thinking through questions such as <math>\_ + 5 = 9</math>. Such experiences form the basis of finding an “unknown quantity”, leading in later years to setting up and solving equations.</li> </ul>	<p><b>Concept – Operations</b> <u>Skill – Fact Families..add &amp; Subtract</u> Level A, B and C <b>Concept Problem Solving</b> Strategies <u>Skill – Guess and Check:</u> Lesson: The Camp.</p>

**Middle Childhood  
(Years 3-7)**

TOPIC	RELEVANT EXERCISES
<p><u>Number</u> <i>Key Ideas</i></p> <ul style="list-style-type: none"> <li>• Place values concepts should be emphasized to develop a sense of the large whole numbers and of decimal numbers.</li> </ul>	<p><b>Understanding Fractions.</b> 5) <u>Introduction to Decimals</u> Understanding Place values <b>Understanding Whole Numbers and Integers.</b></p>

<ul style="list-style-type: none"> <li>• Students learn to read, write and use different representations of numbers: whole numbers, common fractions, decimal fractions and percentages.</li> <li>• Students learn the meaning of decimal and their relative order and size.</li> <li>• Students expected to make conscious choices from among operations to apply in a given situation.</li> <li>• Students should use concrete materials, diagrams and calculators to work out basic products,</li> <li>• It should become clear to children that they need to calculate numbers larger than those that can be dealt with by remembering number facts and should investigate methods for carrying out those calculations.</li> </ul>	<p>1) <u>The meaning of whole number can/us</u></p> <p><b>Understanding Fractions:</b></p> <p>1) <u>The meaning of Fractions:</u></p> <p><b>Understanding Fractions:</b></p> <p>5) <u>Introduction to Decimals:</u></p> <p><b>Understanding Whole numbers and integers.</b></p> <p>1) <u>Adding and subtracting whole numbers</u></p> <p>2) <u>Multiplying and dividing whole numbers.</u></p>
<p><u>Measurement</u></p> <p><i>Key Ideas</i></p> <ul style="list-style-type: none"> <li>• Work should be practical and students make sensible choices as to which quantities should be measured for task at hand, which units to use, and which measuring tool is suitable.</li> <li>• Find areas of shapes and develop idea that a unit is a size or amount rather than a particular shape or object and to make generalizations about units.</li> <li>• Students should develop a feel for the size of millimetres, centimetres and (metres and the associated square and cubic measure) litres, kilograms, seconds and minutes and use these in making suitable estimates.</li> <li>• Students should use a range of graduated measuring scales and the relationship between units represented by the metric prefixes</li> </ul>	<p><b>Understanding measurement and geometry.</b></p> <p>1) An introduction to measurement</p> <p><b>Understanding Measurement and Geometry.</b></p> <p>1) <u>Perimeter and Polygons.</u></p> <p>2) <u>The Circle</u></p> <p>3) <u>Solids....volume and surface area.</u></p>

<p>of milli, centi and kilo.</p> <ul style="list-style-type: none"> <li>• Students learn to use scale factors.</li> </ul>	
<p><b>Chance and Data</b> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students collect, represent and interpret data in order to answer questions of interest to them.</li> <li>• Students carry out investigations which involve chance processes (tossing coins, selecting different-coloured lollies from a container etc) Noting that different results are likely in repeats.</li> <li>• Students conduct surveys, drafting questions, testing different versions of them for clarity and bias and redrafting to improve their usefulness.</li> <li>• Students are introduced to new methods of representation, with a repertoire that includes fractions and averages, tables, plots and graphs and databases.</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><b>Understanding Probability.</b></p> <ol style="list-style-type: none"> <li>1) <u>Introduction to probability.</u></li> <li>2) <u>Whats the Chance?</u></li> <li>3) <u>Dice probabilities.</u></li> </ol> <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> <li>3) <u>Points on a grid.</u></li> </ol>
<p><b>Space</b> <i>Key Ideas</i></p> <ul style="list-style-type: none"> <li>• Students investigate the features of objects in the environment, including their shape, and the effect on them of changes in size, shape or position.</li> <li>• Students should be enabled to represent shapes in various orientations and sections, movements, paths and locations.</li> <li>• Students should make spatial patterns and investigate various symmetries and tessellations.</li> <li>• Students develop an ability to interpret and produce drawings of 3-D shapes and investigate the relationship between 3-D shapes and their 2-D nets leading to the capacity to sketch, plan and make models.</li> </ul>	<p><b>Understanding Graphing</b></p> <ol style="list-style-type: none"> <li>4) <u>Transformations</u></li> </ol> <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>

<ul style="list-style-type: none"> <li>• Students should sort and classify shapes and movements according to spatial criteria and interpret spatial language and use it for themselves.</li> <li>• Students should develop skills in representing and describing location to including grids, distances and directions. They should learn to relate direction and angle of turning to compass directions and use a magnetic compass to determine simple directions.</li> </ul>	
<p><u>Algebra</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students work with a variety of numerical and spatial patterns.</li> <li>• Students develop notions of how variation in one quantity is related to variation in another.</li> <li>• Student develop different methods of communication with relationships being described in words, orally or written and also graphically using both informal sketch graphs and those based on actual measurements.</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> </ol>

**Early Adolescence  
(Years 7-10 )**

<b>TOPIC</b>	<b>RELEVANT EXERCISES</b>
<p><u>Numbers</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students should improve their capacity to represent numbers in a variety of ways and move flexibly between representations.</li> <li>• An understanding of decimal place value should continue to be a focus of learning experiences.</li> <li>• Students should be learning to apply number operations to a wide range of problem situations,</li> </ul>	<p><b>Understanding Fractions:</b></p> <ol style="list-style-type: none"> <li>14) <u>Addition and Subtraction of Decimals.</u></li> <li>15) <u>Multiplication and Division of Decimals.</u></li> </ol> <p><b>Understanding Whole Numbers and Integers:</b></p> <ol style="list-style-type: none"> <li>9) <u>Order of operations</u></li> </ol> <p><b>Understanding Fractions:</b></p> <ol style="list-style-type: none"> <li>12) <u>Order of Operations</u></li> </ol> <p><b>Understanding Whole Numbers and</b></p>

<p>developing the skills necessary to select operations and procedures and judge the reasonableness of results</p> <ul style="list-style-type: none"> <li>• Students extend the types of numbers on which they can operate to include addition and subtraction of negative numbers which arise in realistic settings.</li> <li>• Students gain an understanding of social and commercial arithmetic.</li> </ul>	<p><b>Integers</b></p> <ol style="list-style-type: none"> <li>4) <u>The Meaning of Integers</u></li> <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> </ol> <p><b>Understanding Percentages:</b></p> <ol style="list-style-type: none"> <li>6) <u>Problems Involving Percent</u></li> <li>7) <u>Percent in Business</u></li> </ol>
<p><u>Measurement</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students become proficient with commonly used measuring equipment, develop a good feel for the size of various standard units and become competent at estimating in standards.</li> <li>• Students carry out practical tasks involving measurement. They should plan, make judgments about which measurements to make, organize and carry out the measurements and decide whether the results are of the right magnitude.</li> <li>• Students learn a range of sensible methods of indirect measure such as mensuration formulae, Pythagoras theorem, rates and differences, similarity and scale.</li> <li>• Students investigate right angle triangles and from this investigation note that similar right triangles have equal corresponding ratios-the basic principle of right triangle trigonometry.</li> </ul>	<p><b>Understanding Measurement and Geometry:</b></p> <ol style="list-style-type: none"> <li>7) <u>Constructions</u></li> <li>8) <u>Projective Geometry.</u></li> </ol> <p><b>Understanding Exponents:</b></p> <ol style="list-style-type: none"> <li>6) Pythagoras Theorem.</li> </ol> <p><b>Understanding Measurement and Geometry:</b></p> <ol style="list-style-type: none"> <li>5) <u>Angles and their Measure</u></li> <li>6) <u>Angles and Polygons.</u></li> <li>9) Ratios for areas and volumes</li> </ol>
<p><u>Chance and Data</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students learn to estimate probabilities experimentally.</li> <li>• Students may plan and execute surveys about student opinions.</li> <li>• Students should be learning to</li> </ul>	<p><b>Understanding Probability</b></p> <ol style="list-style-type: none"> <li>2) <u>What's The Chance?</u></li> <li>3) <u>Dice Probabilities</u></li> <li>4) <u>Binomial Probabilities.</u></li> <li>7) <u>Independent Events</u></li> <li>8) <u>Dependent Events</u></li> </ol>

<p>interpret various representations of data including means, measures of variability and association, line plots, histograms, stem and leaf plots, box plots, scatter plots and lines of best fit.</p> <ul style="list-style-type: none"> <li>• The student should understand the conditions under which their use is appropriate and compare and select from different possible representations of the same data.</li> </ul>	<p><b>Understanding Graphing:</b> 2) <u>Statistics</u></p>
<p><u>Space</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• All students should examine 2-D and 3-D geometric shapes, investigating and describing relationships between classes of shapes (e.g. All squares are rhombuses and all squares are also rectangles but not all rhombuses and rectangles are square.)</li> <li>• Students should visualize, demonstrate and describe the effect of reflections, rotations, translations and enlargements on shape, size, orientation and arrangement and recognize and produce associated symmetries.</li> <li>• Students should use and compare several different conventions for representing 3-D objects in 2-D e.g. plans and elevations, isometric drawings, perspective drawings, orthogonal drawings, contour maps and Mercator and other geographic maps.</li> </ul>	
<p><u>Algebra</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> <li>• Students should have extensive experience in observing patterns and relationships among quantities and representing them symbolically and graphically.</li> <li>• Students should be able to make</li> </ul>	<p><b>Understanding Algebra:</b> 3) <u>Patterns, Patterns, Patterns</u> 4) <u>Patterns, Formulas, Substitution.</u></p> <p><b>Understanding Graphs:</b> 5) <u>Relations, equations and functions</u> 6) <u>Linear Relations</u></p>

<p>sketches that reflect the difference between discrete and continuous data and between situations which are essentially deterministic and those which involve an element of chance</p> <ul style="list-style-type: none"> <li>• Students should develop an intuitive grasp of general shapes of particular kinds of functions (including linear, quadratic, exponential, reciprocal and periodic.)</li> <li>• Students should learn to manipulate simple algebraic expressions</li> <li>• Students should be developing facility with notational conventions and properties such as additive and multiplicative inverse and distributive property of multiplication over addition in order to rearrange expressions and solve equations. From spatial or numerical investigations, they should establish and come to recognize common identities such as <math>a^2 - b^2 = (a - b)(a + b)</math> and apply these in various contexts.</li> <li>• Student should formulate equations and inequalities from a range of numerical, spatial and measurement contexts and develop a repertoire of ways to solve them including “guess, check and improve” and graphical methods.</li> <li>• Some student may learn to solve pairs of simultaneous equations and quadratic equations analytically.</li> </ul>	<ul style="list-style-type: none"> <li>7) <u>Slope of a line</u></li> <li>8) <u>Equations of a Straight Line</u></li> <li>9) <u>Quadratic functions.</u></li> </ul> <p><b>Understanding Graphs:</b></p> <ul style="list-style-type: none"> <li>5) <u>Relations, equations and functions</u></li> <li>6) <u>Linear Relations</u></li> <li>7) <u>Slope of a line</u></li> <li>8) <u>Equations of a Straight Line</u></li> <li>9) <u>Quadratic functions.</u></li> </ul> <p><b>Understanding Equations:</b></p> <ul style="list-style-type: none"> <li>1) <u>Tiles, Balances and Equations</u></li> <li>2) <u>Solving One-step Equations</u></li> <li>3) <u>Solving Two-step Equations</u></li> <li>4) <u>Solving Multi-step Equation</u></li> <li>5) <u>Problem Solving</u></li> <li>6) <u>Solving Linear systems</u></li> </ul> <p><b>Understanding Equations:</b></p> <ul style="list-style-type: none"> <li>7) <u>Solving inequalities</u></li> <li>8) <u>Solving Absolute Value equations</u></li> </ul>
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