

South Australia*

Early Years (Birth to Year 2)

**Please note that in Understanding Numeration the topics are in order of difficulty. Due to the syllabus structure of South Australia, a year by year synopsis is not possible, therefore the type of topics that the children should do are given below in correlation to the outcomes given 'per group'.*

| TOPIC | RELEVANT EXERCISE |
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| <p><u>Exploring, Analysing and modeling data</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Generates and organizes data and uses it to make personal and collective plans. • Uses everyday comparative language and number to describe data they have generated and describe how data assists them to answer their own question. • Recognises situations whose outcomes are certain, impossible or unpredictable; states possible outcomes for particular events and uses everyday language to describe likelihood of outcomes occurring. • Describes key features of data and draws conclusions from similar data form different groups. Make general predictions based on results. • Poses questions, explores patterns, and collects relevant data, they record and represent data and also use data presented by others. • Describes situations where chance plays a role. | <p>Concept – Counting <u>Skill - Estimating the Number of Objects and Reasonableness</u> Level A</p> <p><u>Skill - Associating Numbers in a Real World Context</u> Level A & B</p> <p><u>Skill - 1 to 1 Correspondence of # to Objects</u> Level A</p> <p>Concept - Operations <u>Skill - Introduce Addition... Concretely... “in all” & “altogether”</u></p> <p><u>Skill - Introduce Subtraction Concretely ... “take away”</u></p> <p>Problem Solving <u>Skill – Guess & Check</u> Lesson The Camp</p> <p><u>Skill – Guess & Check</u> Lesson The Gravy Spill</p> |
| <p><u>Measurement</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Compares and orders the measurable attributes of distance, space, surface, mass, turn/angle and time to describe the size of a wide range of familiar figures, objects and events. • Chooses and uses a variety of strategies to measure the size of a | <p>Concept – operation <u>Skill Finding the area of a shape</u> Level D</p> <p><u>Skill – finding the perimeter of a shape:</u> Level C and D</p> <p>Concept – Comparing and ordering <u>Skill- Understand and measurement of time:</u> Level B and C</p> |

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| <p>wide variety of figures, objects and events drawn from world around them</p> <ul style="list-style-type: none"> • Chooses, estimates and uses metric units to measure attributes of figures and objects; orders events or cycles of events; estimates the duration and time of events; constructs and uses measuring tools, explains that all measurement is approximation and that some tools increase precision. • Uses direct measuring strategies to represent, communicate and record measurements graphically in symbols with correct units and performs simple operations on measures. | <p><u>Skill – Describe elapsed time...hours, 5 mins:</u> Level c and D</p> <p><u>Skill – Describe Elapsed time – minutes</u> Level D</p> <p><u>Skill – Describe back in time...hours, 5 mins:</u> Level C and D</p> <p><u>Skill – Describe back in time ...minutes:</u> Level D</p> <p><u>Skill – Estimating the number of objects and reasonableness:</u> Level A and B</p> <p>Concept – Comparing and ordering <u>Skill – Reading and comparing temperatures:</u> Level C</p> |
| <p><u>Number</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Uses Base 10 number system and fractions to represent numbers collections of objects, measurements and data. • Describes, represents and uses a variety of counting strategies and the four number operations to estimate and quantify collections of objects, units of comparison and amounts of money • Uses counting strategies to answer questions about situations that involve number operations (Addition and Subtraction), use of calculator and informal and standard algorithms. • Represents and compares rational numbers in a variety of ways, describing relationships among them. • Describes, represents and applies operations with whole numbers • Uses a variety of estimating and calculating strategies, including memorizing addition and | <p>Concept – Counting <u>Skill – reading and printing numerals:</u> Level A, B and C</p> <p><u>Skill – Introduce Fractions...equal parts:</u> Level B</p> <p><u>Skill- Introduce common Fractions as parts of a whole:</u> Level B and C</p> <p>Concept – Counting <u>Skill – counting using money</u> Level B, C and D</p> <p><u>Skill – Associating Numbers in a real world context:</u> Level A</p> <p>Concept – Comparing and organizing <u>Skill – working with Whole Numbers $>$, $<$, $=$.</u> Level A, B, C and D</p> <p>Concept – Operations <u>Skill – Introduce Addition concretely...”in all” & “all together”:</u> Level A</p> <p><u>Skill – introduce Addition concretely...”and”:</u></p> |

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| <p>subtraction facts with whole numbers and with money represented as decimals</p> | <p>Level A <u>Skill – Introduce the Symbolism...</u> <u>Skill – Demonstrate Addition facts (making 5-10):</u> Level A <u>Skill – Addition Strategies:</u> Level A, B and C <u>Skill - Introduce Subtraction Concretely ...</u> “take away” <u>Skill - Introduce Subtraction Symbolism</u> <u>Skills - Subtract # Digit Numbers ...</u> <u>Skills - Introduce Multiplications ...</u> <u>Skill - Introduction to Division</u> <u>Skills - Introduce Division ...</u></p> |
| <p><u>Pattern and Algebraic reasoning</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Recognise and constructs spatial and numerical patterns. Continues these patterns and predict what comes next. • Represent and communicates spatial and numerical patterns • Describes and represents situations from personal and family experiences and interaction with the environment where there is change over time. • Searched for, represents and analyses different forms of spatial and numerical patterns, and relates these to everyday life. • Represents and communicates patterns with everyday and mathematical language, including symbols, sketches, materials, number lines and graphs • Uses materials, data and informal graphs to represent change. | <p>Concept – problem solving <u>Skill – Find a pattern::</u> Lesson Johnny’s pennies <u>Skill – Find a Pattern:</u> Lesson Toy animals.</p> <p>Concept – comparing and ordering <u>Skill – Locate numbers on a number line:</u> <u>Skill – Locate whole numbers on a grid:</u> <u>Skill - Locate Numbers on a Numberline</u> <u>Skill - Locate Whole Numbers on a Grid</u> <u>Skill - Introduce “Greater Than” “Less Than”</u> <u>Skill - Working with Whole Numbers >, <, =</u> <u>Skill - Understanding... “Just Before”... “Just After”... “Between”</u></p> <p>Concept – Problem Solving Strategies <u>Skill – Make a graph</u> Lesson animals <u>Skill – Make a Table</u> Lesson Muffins <u>Skill- Make a graph</u> Lesson classroom shoes.</p> |
| <p><u>Spatial Sense and Geometric Reasoning</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Uses key spatial features to describe and represent 2-D and 3-D shapes. • Uses simple transformation to | <p>Concept – Counting <u>Skill – Recognize and count solids:</u> Level B and C <u>Skill – Recognise and count 2-D Figures:</u> Level B and C</p> |

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| <p>orientate and move familiar objects and themselves when they are constructing, arranging and locating.</p> <ul style="list-style-type: none"> • Uses everyday and positional language and makes informal maps to represent their location and familiar places. • Compares and analyses relationships between and within the 2-D and 3-D shapes objects to represent their world • Predicts, describes and represents the result of using combination of reflections (flips) Translations (slides) and rotations when arranging shapes, searching for patterns and describing pathways. • Uses positional language and measurements to formally map location and arrangements. | |
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**Primary Years
(Years 3-5)**

| TOPIC | RELEVANT EXERCISE |
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| <p><u>Exploring, analyzing and modeling data.</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Poses Questions, explores patterns, and collects relevant data. Students record and represent data and also use data presented by others. • Describes key features of data and draws conclusions from similar data from different groups. Students make general predictions based on results. • Describes situations where chance plays a role. Collects, organizes and represents data to identify possible outcomes. Uses comparative | <p>Understanding Graphing</p> <ol style="list-style-type: none"> 1) <u>Reading and Sketching Graphs</u> 2) <u>Statistics</u> <p>Understanding Probability.</p> <ol style="list-style-type: none"> 1) <u>Introduction to probability.</u> 2) <u>Whats the Chance?</u> 3) <u>Dice probabilities.</u> <p>Understanding Graphing</p> <ol style="list-style-type: none"> 3) Statistics 4) Points on a grid <p>Understanding Probability.</p> <ol style="list-style-type: none"> 1) <u>Introduction to probability.</u> |

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| <p>language to describe likelihood of each outcome.</p> <ul style="list-style-type: none"> • Poses question, determines a sample, collects and records data including related data, represents sample data in order to investigate the world around them • Summarises, recognizes bias, draws conclusions and makes conjectures about data. Understands how different organization and representation influence data interpretation. <p>Analyses data to search for patterns in events where the range of outcomes is generated by situation when chance plays a role</p> | <p>2) <u>Whats the Chance?</u> <u>Dice probabilities.</u></p> |
| <p><u>Measurement</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Chooses, estimates and uses metric units to measure attributes of figures and objects; order events or cycles of events; estimates the duration and time of events; constructs and uses measuring tools, explains that all measurement is approximate and that some tools increase precision. • Uses direct measuring strategies to represent, communicate and record measurements graphically in symbols with correct units and performs simple operations on measures. • Selects appropriate attributes and systems to measure for a variety of purposes and reports on how measurement is used in social practice. • Uses a range of standard tools to measure relationships between distances and other measurable attributes to calculate size | <p>Understanding Measurement and geometry 1) <u>An Introduction to measurement.</u></p> |
| <p><u>Number</u> <i>Key Ideas:</i></p> | <p>Understanding Whole Numbers and Integers</p> |

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| <ul style="list-style-type: none"> • Represents and compares rational numbers in a variety of ways, describing relationships among them • Describes, represents and applies operations with whole numbers. • Uses a variety of estimating and calculating strategies, including memorizing addition and subtraction facts with whole numbers, and with money represented as decimals. • Represents and analyses relationships amongst number concepts and uses these to make sense of and represent the world. • Describes , represents and analyses operations with rational numbers and relationships between them • Uses a variety of estimating and calculating strategies with whole numbers, including memorizing multiplication and division facts, fractions and decimals | <p>1) The meaning of whole numbers</p> <p>Understanding Fractions</p> <ol style="list-style-type: none"> 1) <u>The meaning of Fractions</u> 2) <u>Multiplication tables</u> 3) <u>Equivalent fractions</u> 4) Percent ...a special fraction 5) Introduction to decimals. <p>Understanding Whole Numbers and Integers</p> <ol style="list-style-type: none"> 2) <u>Adding and subtracting whole numbers</u> 3) <u>Multiplying and dividing whole numbers</u> <p>Understanding Fractions</p> <ol style="list-style-type: none"> 4) <u>Introduction to Decimals.</u> <p>Understanding Fractions</p> <ol style="list-style-type: none"> 6) <u>Percents...fractions...decimals.</u> <p>Understanding Fractions</p> <ol style="list-style-type: none"> 8) <u>Adding Fractions</u> 9) <u>Subtracting Fractions</u> 14) <u>Addition and Subtraction of Decimals.</u> (For the more advanced) 10) <u>Multiplying Fractions</u> 11) <u>Dividing Fractions.</u> 15) <u>Multiplication and Division of Decimals.</u> |
| <p><u>Patterns and algebraic reasoning</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Searches for, represents and analyses different forms of spatial and numerical patterns and relates these to everyday life • Represents and communicates Patterns with everyday and mathematical language, including symbols, sketches, materials, number lines and graphs • Uses materials, data and informal graphs to represent change • Describes and generalizes relationships between measurable attributes as patterns and explains the impact of varying one aspect of | <p>Understanding Graphs</p> <ol style="list-style-type: none"> 1) <u>Reading and sketching Graphs.</u> <p>Algebra</p> <ol style="list-style-type: none"> 2) Tiles and Algebra 3) Patterns, Patterns, Patterns. |

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| <p>the relationship</p> <ul style="list-style-type: none"> Analyses, creates and generalizes numerical and spatial patterns and solves problems with such patterns Uses mathematical representations to make connections and analyse change. | |
| <p><u>Spatial sense and geometric reasoning</u> <i>Key Ideas:</i></p> <ul style="list-style-type: none"> Compares and analyses relationships between and within 2-D and 3-D shapes and objects to represent their world. Predicts, describes and represents the result of using combinations of reflections (flips), translations (slides) and rotations when arranging shapes, searching for patterns and describing pathways Uses positional language and measurements to formally map location and arrangements. Describes and generalizes spatial relationships within and between groups of 2-D and 3-D shapes and objects and appreciates their application in a range of cultural contexts Analyses the result of a series of flips, slides, rotations and reflections and translations and uses scales to undertake enlargements and reductions of figures and objects Produces, uses and critiques scaled maps and plans and envisages alternative possibilities. | <p>Understanding Measurement and Geometry</p> <ol style="list-style-type: none"> <u>Perimeter and area of Polygons.</u> <u>The circle</u> <u>Solids... Volume and Surface Area</u> |

**Middle Years
(Years 6-10)**

| TOPIC | RELEVANT EXERCISES |
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| <u>Exploring, analyzing and modeling data.</u> | |

Key Ideas:

- Poses questions, appropriates designs a survey, collects data and classifies sequence, collapses, tabulates and represents the data.
- Reads and describes information in given tables, diagrams, line and bar graphs. Makes predictions based on the information, understanding the limitations of data interpretation and possible social consequences of these limitations.
- Interprets data and makes numerical statements about probability, models situations, using data to validate their theories about the fairness of everyday situations including hypothetical situations.
- Plans experiments and surveys, checks data for inconsistencies; represents and reports on central tendency and spread of data
- Displays and summarises data to show location and spread while interpreting and critiquing collected and published data from a variety of sources and perspectives (describing distributions, making comparisons, inferences and predications)

Understanding Graphing:

- 2) Statistics
- 3) Points on a grid

Understanding Probabilities:

- 2) What's the Chance?
- 3) Dice Probabilities
- 4) Binomial probabilities.
- 5) Geometric probabilities
- 6) Pascal's triangle
- 7) Independent events
- 8) Dependent Events

Measurement

Key Ideas:

- Selects appropriate measurement units and scale to conduct collaborative research into issues associated with the social or physical world.
- Applies a variety of techniques and tools and uses a range of measurement formulae to solve problems.
- Appropriately selects uses and communicates attributes, units and systems of measurements.

Understanding Measurement and Geometry:

- 4) Solids...Volume and Surface Area
- 5) Angles and their measure
- 6) Angles and Polygons

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| <p><u>Number</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Represents and analyses relationships amongst integers, rational numbers and commonly encountered irrational numbers. • Communicates understanding of the meaning of operations with integers and rational numbers and how they relate to each other. • Applies appropriate computational tools and strategies to proportional situations involving integers and rational numbers • Uses numbers, relationships among numbers and number systems and represents and discusses these understandings with others. • Demonstrates and justifies understanding of the meaning of operations with numbers and how they relate to each other in modeling growth and change • Uses computational tools and strategies fluently and can estimate appropriately. | <p>Understanding Whole Number and Integers</p> <p>4) <u>The Meaning Of Integers</u></p> <p>Understanding Whole Number and Integers:</p> <p>5) <u>Adding Integers</u></p> <p>6) <u>Subtracting Integers</u></p> <p>7) <u>Multiplying integers</u></p> <p>8) <u>Dividing integers</u></p> <p>Understanding Whole Number and Integers:</p> <p>9) <u>Order of Operations</u></p> <p>Understanding Fractions:</p> <p>12) <u>Order of Operations.</u></p> |
| <p><u>Pattern and algebraic reasoning</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Analyses, creates and generalizes numeric and visual patterns to solve problems in a range of applications. • Uses symbolic algebra to represent situations and manipulate the symbolic representations to solve the problems involving linear equations and inequations gives simple algebraic proofs. • Models contextualized situation, making connections and analyzing change. • Recognises equivalent forms of an expression, equation function or relations; recognizes range of families of function, analyses parameter changes and describes | <p>Understanding Algebra:</p> <p>3) <u>Patterns, patterns, patterns</u></p> <p>4) <u>Patterns, formulas, Substitution.</u></p> <p>5) <u>Adding Expressions</u></p> <p>6) <u>Subtracting Expressions</u></p> <p>7) <u>Multiplying Expressions</u></p> <p>8) <u>Factoring Expressions</u></p> <p>9) <u>Dividing Expressions</u></p> <p>Understanding Equations</p> <p>2) <u>Solving one-step Equations</u></p> <p>3) <u>Solving Two-Step Equations</u></p> <p>4) <u>Solving Multi-Step Equations</u></p> <p>6) <u>Solving Linear Systems</u></p> <p>7) <u>Solving Inequalities.</u></p> <p>Understanding Graphing:</p> <p>5) <u>Relations, Equations, and functions.</u></p> <p>6) <u>Linear Relations</u></p> |

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| <p>local and global behaviour of such functions.</p> <ul style="list-style-type: none"> • Represents advanced functions with symbolic algebra, sketches, graphs and tables; solves problems by manipulating equations involving advanced functions. • Uses a variety of mathematical models to make connections and analyse how things might change in both real and abstract contexts. | <p>Understanding Graphs:</p> <p>7) <u>Slope of a line</u></p> <p>8) <u>Equations of a straight Line</u></p> <p>9) <u>Quadratic Equations.</u></p> |
| <p><u>Spatial sense and geometric reasoning.</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Identifies characteristics and properties of 2-D and 3-D shapes and understand how these have influenced the built environment • Identifies, represent and justifies one and two step geometrical transformations • Represents and uses location maps, pathways diagrams and network diagrams to describe current and possible future characteristics of the physical world. • Makes and tests conjectures involving 2-D and 3-D shapes. • Examines conjectures using geometric transformations • Selects and uses different representational systems to describe, analyse and interpret objects, pathways and arrangements. | <p>Understanding Measurements and Geometry”</p> <p>4) <u>Solids...Volume and Surface area</u></p> <p>7) <u>Constructions</u></p> <p>8) <u>Projective Geometry.</u></p> <p>9) <u>Ratios for Areas and Volumes</u></p> |
| <p><u>Analysing and modeling change (Begins in year 10)</u></p> <p><i>Key Ideas:</i></p> <ul style="list-style-type: none"> • Draws, describes and justifies graphical relationships between variables • Describes change and varying rates of change and makes predictions when analyzing graphical information | |

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| <ul style="list-style-type: none">• Uses and interprets relationships between variables as a tool for analyzing and modeling change in a range of contexts. | |
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