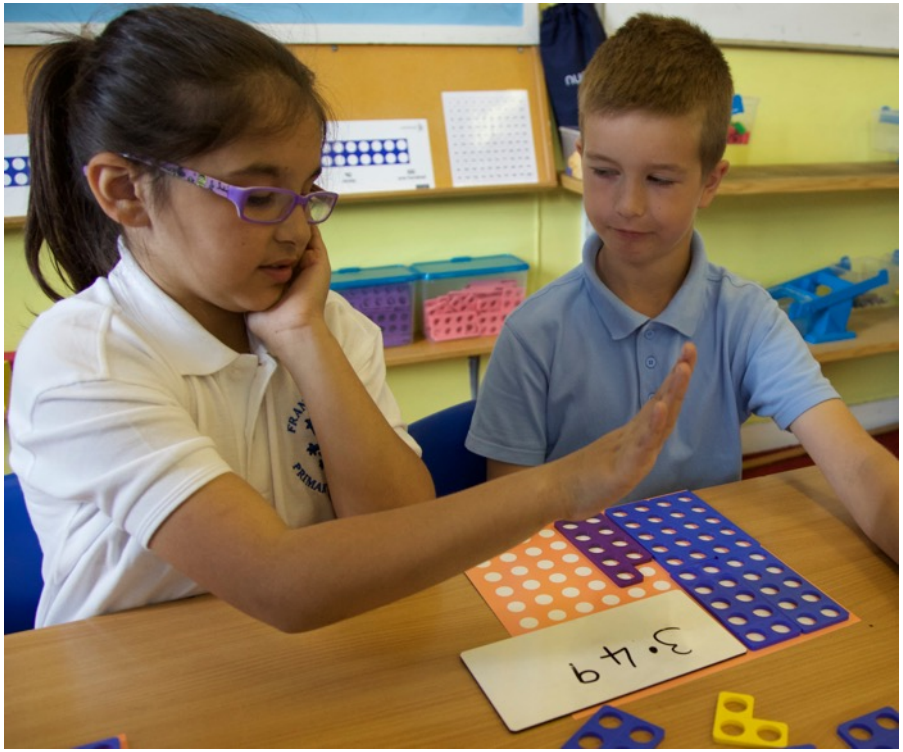
Numicon

Numicon 1 - 6 links with the New Zealand Curriculum
- Achievement Objectives



NZ Curriculum and Links with Numicon

NZ Curriculum Level 1	Numicon 1
Number strategies • Use a range of counting, grouping, and equal sharing strategies with whole numbers and fractions. **Number knowledge** • Know the forward and backward counting sequences of whole numbers to 100. • Know groupings with five, within ten, and with ten. **Equations and expressions** • Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **Patterns and relationships** • Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. • Create and continue sequential patterns.	Numicon 1 usually in 1 year **Number - number and place value** • count to and across 100; read and write numbers to 100 • count in multiples of 2s, 5s and 10s • read and write numbers from 1 to 20 in numerals and words • patterns of numbers and the units of repeats in patterns **Number - addition and subtraction** • read, write and interpret addition (+), subtraction (−) and equals (=) signs • add and subtract one-digit and two-digit numbers to 20, 0 • solve one-step problems and missing number problems **Number - multiplication and division** • solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher **Number - fractions** • recognise, find and name a half of an object, shape or quantity • recognise, find and name a quarter of an object, shape or quantity
Measurement • Order and compare objects or events by length, area, volume and capacity, weight (mass), turn (angle), temperature, and time by direct comparison and/or counting whole numbers of units. **Shape** • Sort objects by their appearance. **Position and orientation** • Give and follow instructions for movement that involve distances, directions, and half or quarter turns. • Describe their position relative to a person or object. Transformation • Communicate and record the results of translations, reflections, and rotations on plane shapes.	**Numicon 1** **Measurement** Compare, describe and solve practical problems for: lengths and heights, mass/weight ,capacity and volume, time Measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds) Coins and notes Sequence events in chronological order using language Dates, days of the week, weeks, months, years Tell the time to the hour and half past the hour **Geometry - properties of shapes** Recognise and name common 2-D and 3-D shapes, including: • 2-D shapes • 3-D shapes **Geometry - position and direction** • describe position, direction and movement, including whole, half, quarter and three-quarter turns
Statistical investigation • Conduct investigations using the statistical enquiry cycle: – posing and answering questions – gathering, sorting and counting, and displaying category data – discussing the results. **Statistical literacy** • Interpret statements made by others from statistical investigations and probability activities. Probability • Investigate situations that involve elements of chance, acknowledging and anticipating possible outcomes.	Integrated throughout the above strands with generalising in life contexts • Picture graphs

Level 2	Numicon
Number strategies • Use simple additive strategies with whole numbers and fractions. **Number knowledge** • Know forward and backward counting sequences with whole numbers to at least 1000. • Know the basic addition and subtraction facts. • Know how many ones, tens, and hundreds are in whole numbers to at least 1000. • Know simple fractions in everyday use. **Equations and expressions** • Communicate and interpret simple additive strategies, using words, diagrams (pictures), and symbols. **Patterns and relationships** • Generalise that whole numbers can be partitioned in many ways. • Find rules for the next member in a sequential pattern	**Numicon 2** **Number** • Patterns and sequences of 2s, 5s, and 10s • Counting to 100 and beyond • Comparing and ordering numbers to 100 • Recognise the place value of 2-digit number **Addition and Subtraction** • When/how to add/subtract to solve problems • Adding and subtracting facts to 20 • Adding 3 numbers **Multiplication and Division** • Working with multiplying and dividing • Learning 2x, 5x and 10x tables **Fractions** • Recognising halves, quarters and thirds of wholes • Understanding fractions as numbers
	Numicon 3 **Number** • Partitioning 2- and 3-digit numbers • Comparing and ordering numbers to 1000 **Addition and Subtraction** • Developing fluency - + - in 2- and 3-digit numbers • Using apparatus and imagery and number stories in + - **Multiplication and Division** • Exploring multiplying and dividing • Using apparatus and imagery and number stories in x ÷ • Learning 3x, 6x 4x, 8x tables **Fractions** • Understanding fractions of a wholes & numbers • Using fraction notation
Measurement • Create and use appropriate units and devices to measure length, area, volume and capacity, weight (mass), turn (angle), temperature, and time. • Partition and/or combine like measures and communicate them, using numbers and units. **Shape** • Sort objects by their spatial features, with justification. • Identify and describe the plane shapes found in objects. Position and orientation • Create and use simple maps to show position and direction. • Describe different views and pathways from locations on a map. **Transformation** • Predict and communicate the results of translations, reflections, and rotations on plane shapes.	**Numicon 2** **Geometry** • Making and classifying polygons • Identifying/describing faces, edges, vertices of 3D • Symmetrical patterns, identifying lines of symmetry • Identifying and naming prisms **Measurement** • Exploring fractions of rotations • Telling the time to five minutes, including quarter past/to the hour
	Numicon 3 **Geometry** • Building skeleton 2D and 3D shapes • Identifying regular and irregular polygons • Making and identifying right angles and types of lines

	• Sorting 2D and 3D shapes using sorting diagrams • Describing position and movement on a grid **Measurement** • Telling the time (analogue and digital) 12-hour clocks • Measuring mass, capacity, length using standard units • Understanding discrete and continuous scales
Statistical investigation • Conduct investigations using the statistical enquiry cycle: – posing and answering questions – gathering, sorting, and displaying category and whole-number data – communicating findings based on the data. **Statistical literacy** • Compare statements with the features of simple data displays from statistical investigations or probability activities undertaken by others. **Probability** • Investigate simple situations that involve elements of chance, recognising equal and different likelihoods and acknowledging uncertainty.	Integrated throughout the above strands with generalising in life contexts • Creating block graphs and bar graphs Integrated throughout the above strands with generalising in life contexts
Level 3	**Numicon**
Number strategies • Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **Number knowledge** • Know basic multiplication and division facts. • Know counting sequences for whole numbers. • Know how many tenths, tens, hundreds, and thousands are in whole numbers. • Know fractions and percentages in everyday use. **Equations and expressions** • Record and interpret additive and simple multiplicative strategies, using, words, diagrams, and symbols, with an understanding of equality. **Patterns and relationships** • Generalise the properties of addition and subtraction with whole numbers. • Connect members of sequential patterns with their ordinal position and use tables, graphs, and diagrams to find relationships between successive elements of number and spatial patterns.	**Numicon 4** **Number** • Understanding place value in 4-digit numbers • Ordering, comparing numbers, rounding to 1000+ • Factors, multiples **Addition and Subtraction, Multiplication and Division** • Developing fluency for adding and subtracting • Developing fluency with multiplying and dividing facts to 12 x 12 • Learning remaining tables to 12x • Developing fluency for multiplying and dividing **Negative numbers** • Exploring negative numbers **Fractions and Decimals** • Exploring decimal fractions • Exploring equivalent fractions
	Numicon 5 **Number** • Reading/working -digits & multiples to seven places • Interpreting negative numbers in context • Recognise/describe linear number sequences, rules • + And - numbers 4 plus digits, algorithms reasoning • Square numbers (2) and cubed (3) • Scaling by simple fractions and simple rates • Fractions –multiples, equivalent, tenths and hundredths, mixed, improper fractions • + And – fractions, x proper fractions/mixed numbers • Decimal -fractions, hundredths, tenths & decimal equivalents, rounding • Per cent %, fraction and as a decimal • Percentage & decimal equivalents of ½, ¼ 1/10, with a multiple of 10 or 25
Measurement • Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time.	**Numicon 4** **Geometry** • Sorting/classifying triangles and quadrilaterals

• Find areas of rectangles and volumes of cuboids by applying multiplication. **Shape** • Classify plane shapes and prisms by their spatial features. • Represent objects with drawings and models. **Position and orientation** • Use a co-ordinate system or the language of direction and distance to specify locations and describe paths. **Transformation** • Describe the transformations (reflection, rotation, translation, or enlargement) that have mapped one object onto another.	• Making/identifying symmetrical figures • Making/identifying types of angles in polygons • Plotting /reading co-ordinates in the first quadrant • Describing/drawing translations on a co-ordinate grid **Measurement** • Measuring mass, capacity and length using decimals • Calculating area and perimeter of rectilinear shapes • Collating, comparing, presenting monetary data • Reading/creating tables and graphs • Telling the time (analogue/digital 24-hour clocks) • Time duration
	Numicon 5 **Geometry** • Calculate and compare the area of rectangles • Estimate volume • Angles -drawn, measured in degrees • Compass points **Measurement** • Convert between different units of metric measure and solve problems involving converting between units of time • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Use all four operations to solve problems involving measures using decimal notation, including scaling.
Statistical investigation • Conduct investigations using the statistical enquiry cycle: – gathering, sorting, and displaying multivariate category and wholenumber data and simple time-series data to answer questions – identifying patterns and trends in context, within and between data sets – communicating findings, using data displays. **Statistical literacy** • Evaluate the effectiveness of different displays in representing the findings of a statistical investigation or probability activity undertaken by others. **Probability** • Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary.	Integrated throughout the above strands with generalising in life contexts • Line graphs, complete, read and interpret information in tables, including timetables • Presenting data
Level 4	**Numicon**
Number strategies and knowledge • Use a range of multiplicative strategies when operating on whole numbers. • Understand addition and subtraction of fractions, decimals, and integers. • Find fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions, and decimals. • Apply simple linear proportions, including ordering fractions. • Know the equivalent decimal and percentage forms for everyday fractions. • Know the relative size and place value structure of positive and negative integers and decimals to three places. **Equations and expressions** • Form and solve simple linear equations.	**Numicon 6** **Number** • Read, write, order and compare numbers to 10 million • use negative numbers and calculate across 0 **Operations** • long multiplation and division up to 4 digits, and interpret remainders as whole number remainders, fractions, or by rounding • common factors, common multiples and prime numbers **Percentages, rate, scale** • calculation and comparison of percentages • problems involving rate and fractions, proportions

Patterns and relationships • Generalise properties of multiplication and division with whole numbers. • Use graphs, tables, and rules to describe linear relationships found in number and spatial patterns.	• solve problems involving similar shapes where the scale factor is known or can be found **Fractions** • common factors to simplify fractions • + - fractions with different denominators and mixed numbers, multiply simple pairs of proper fractions, divide proper fractions by whole numbers • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples **Decimals** • calculate decimal fraction equivalents for a simple fraction • identify the value to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 • four operations of decimals • equivalences between simple fractions, decimals and percentages, including in different contexts • use integer multiplication and division facts where missing values can be found **Algebra** • simple formulae and linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfy an equation with 2 unknowns • enumerate possibilities of combinations of 2 variables
Measurement • Use appropriate scales, devices, and metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time. • Convert between metric units, using whole numbers and commonly used decimals. • Use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids. • Interpret and use scales, timetables, and charts. **Shape** • Identify classes of two- and threedimensional shapes by their geometric properties. • Relate three-dimensional models to two-dimensional representations, and vice versa. **Position and orientation** • Communicate and interpret locations and directions, using compass directions, distances, and grid references. **Transformation** • Use the invariant properties of figures and objects under transformations (reflection, rotation, translation, or enlargement).	**Numicon 6** **Geometry** • use formulae for area and volume of shapes • Calculate the area of parallelograms and triangles • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3] • Draw 2-D shapes using given dimensions and angles • Recognize, describe and build simple 3-D shapes, including making nets • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • Illustrate and name parts of circles, including radius, diameter and circumference • Recognize angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles • Describe positions on the full coordinate grid (all 4 quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes **Measurement** • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places
Statistical investigation • Plan and conduct investigations using the statistical enquiry cycle: • determining appropriate variables and data collection methods • gathering, sorting, and displaying multivariate category, measurement, and time -series data to detect patterns, variations, relationships, and trends • comparing distributions visually • communicating findings, using appropriate displays. **Statistical literacy** • Evaluate statements made by others about the findings of statistical investigations and probability activities. **Probability** • Investigate situations that involve elements of chance by comparing experimental distributions with expectations from models of the possible outcomes, acknowledging	Integrated throughout the above strands with generalising in life contexts • Interpret and construct pie charts and line graphs and use these to solve problems • Calculate and interpret the mean as an average

variation and independence. • Use simple fractions and percentages to describe probabilities.	