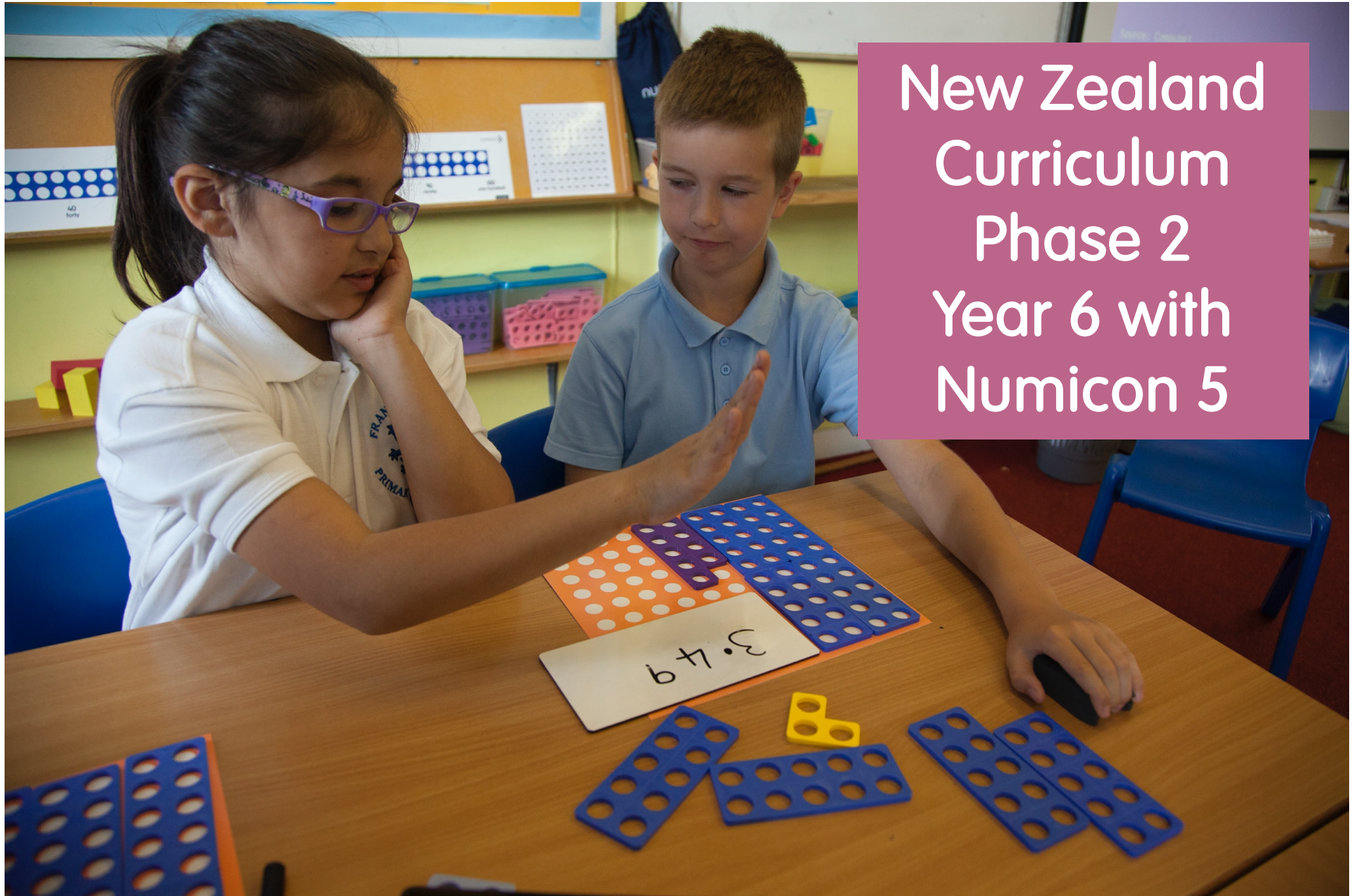


New Zealand
Curriculum
Phase 2
Year 6 with
Numicon 5



Numicon is a proven approach to teaching and learning designed to give children the understanding of mathematical ideas and relationships that is essential for successful reasoning and problem-solving. The use of apparatus builds children's mental image of abstract concepts, and helps to develop their understanding of the connections between different areas of mathematics. The resources cover the key mathematical ideas for processes in mathematics: number, measures, shape, space and data that are essential foundations for further mathematical thinking.

We have correlated focus activities from *Number, Pattern and Calculating 5* and *Geometry, Measurement and Statistics 5* to the Mathematics and the New Zealand Curriculum to support teachers in their planning. These correlations will be useful whether schools choose to follow the focus activities in the order outlined in the Teaching Resource Handbook, or prefer to dip in and out of the teaching materials for different topics.

The **Numicon Approach** fulfils the curriculum to students in a knowledge-rich environment where the concepts are taught alongside the processes of being a mathematician. Where you see references to processes, these are embedded in the learning experiences every week:

- The use of representations to communicate with self and others
- Connections within maths and the daily life of the students
- Investigations
- Generalising
- Explain and justify

Included in the Numicon programme is the strong connection with the language of maths. Every week teachers are provided with a list of words and terms to use in their teaching through meaning and usage. There is an expectation that these words are used by the teachers, displayed on walls. Students are encouraged to use these words and terms with confidence. Every week an assessment goal is the 'use of the words and terms in conversation and effectively in discussion'. For example: Numicon 5 NNS 2: Exploring fractions and Equivalence

Terms for children to use

part-whole relationship, comparing, equivalent fraction, denominator, numerator, proportion, ordinal number names, for every, in every, unit fraction, proper fraction, improper fraction, mixed number, factor, common factor, multiple, times, divide, equivalence, equivalent to, scale up, scale down, reduce, simplest form

Teaching Materials Featured in this Correlation:

Number, Pattern and Calculating 4 Teaching Pack ISBN 978-0-19-838984-2

Geometry, Measurement and Statistics 4 Teaching Pack ISBN 978-0-19-838985-9

Number, Pattern and Calculating 5 Teaching Pack ISBN 978-0-19-848971-9

Geometry, Measurement and Statistics 5 Teaching Pack ISBN 978-0-19-848972-6

Number, Pattern and Calculating 6 Teaching Pack ISBN 978-0-19-830490-6

Geometry, Measurement and Statistics 6 Teaching Pack ISBN 978-0-19-830491-3

2024 Curriculum Phase 2 Year 6 with Numicon 5



Abbreviations: Numicon (N) Pattern & Algebra (P&A) Numbers and the Number System, (NNS), Calculating (C), Geometry (G), Measurement (M), Statistics and Probability (*throughout all the strands*) Preparing for Formal Testing (PFT)

Number Mātauranga tau Number structure recognise the base ten structure of numbers up to 1,000,000	Getting Started NNS 1
identify, read, write, compare, and order whole numbers up to 1,000,000	NNS 1, 4
identify square numbers and factors of numbers up to 125	P & A 3, 4 Act 4, 5, 6. EPB 5C page 7, Pupil Book 5 page 108.
Use mathematical processes to: - connect with metric units that are powers of 10, and with decimal place value – investigate factors and square numbers	The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.
Operations use rounding and estimation to predict and to check the reasonableness of calculations	NNS 4
round whole numbers to a specified multiple of powers of 10, and round tenths and hundredths to the nearest whole number or one decimal place	NNS 4
add and subtract any whole numbers	CAL 1, 2, 7
multiply multi-digit whole numbers (e.g., 54×112)	CAL 8
	Numicon 6 CAL 9 Multiplying
divide whole numbers by a 1-digit divisor, with a remainder (e.g., $198 \div 7$; $4154 \div 8$)	CAL 8, 9

use the order of operations rule GEMA with grouping, addition, subtraction, multiplication, and division	CAL 6, 16
use the mathematical processes to: – connect multiplication, division, and factors with area, volume, and perimeter – connect multiplication and division with proportional reasoning – generalise the use of inverse operations and the commutative and distributive properties, to check findings – investigate comprehending and solving word problems, deciding which operation to use and why – explain and justify findings, by connecting to estimates and other checking methods	Measurement 7 The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.
Rational Number identify, read, write, and represent fractions, decimals (to two places), and percentages	NNS 2, 4, 7 CAL 11
compare and order fractions, decimals (to two places), and percentages and convert decimals, and percentages to fractions	NNS 3, 7 CAL 11
multiply and divide numbers by 10 and 100 to make decimals and whole numbers	CAL 7, 8, 9 To make decimals and whole numbers
for fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, or 100: • – compare and order the fractions • – identify when two fractions are equivalent • – represent the fractions in their simplest form	CAL 11
convert between improper fractions and mixed numbers	NNS 2, 7 CAL 9
find a fraction or percentage of a whole number where the answer is a whole number (e.g., 83 of 48; 30% of \$150)	CAL 11
identify, from a fractional part of a set, the whole set	CAL 14
add and subtract fractions with the same or related denominators (e.g., $\frac{1}{4} + \frac{1}{8}$)	CAL 15
add and subtract whole numbers and decimals to two decimal places	CAL 6
use known multiplication and division facts to scale a quantity	Numicon 3, Cal 9 Doubling and halving Numicon 4 Cal 5 (multiplying), 6 (dividing) 7 (multiplying by 10)

<p>use the mathematical processes to: -</p> <ul style="list-style-type: none"> - connect equivalent fractions and decimals - connect decimal place value and operations with whole number place value and operations - connect decimals with measurement - investigate appropriate situations - explain and justify equivalent fractions - convert between mixed numbers and improper fractions - generalise that multiplying or dividing a number by a power of ten changes the position of the digits on a PV chart (years 5–6) 	<p>- generalise that multiplying or dividing a number by a power of ten changes the position of the digits on a PV chart (years 5–6)</p>
<p>Financial Maths solve problems involving purchases (e.g., ensuring they have enough money) create simple financial plans (e.g., shopping lists, a family budget)</p>	<p>CAL 1, 2, 5, 6, 10, 12, 13, 16 Measurement 7</p>
<p>calculate 10%, 25%, and 50% of whole dollar amounts (e.g., 50% of \$280)</p>	<p>CAL 11</p>
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - connect to rounding, addition and subtraction of decimals to two places, and calculating a percentage of a whole amount - investigate making amounts of money, using different denominations - investigate financial plans and decisions. 	<p>Financial plans and decisions</p>
<p>Taurangi Algebra Generalising Number Properties use the distributive, commutative, and associative properties</p>	<p>P & A 2 CAL 8</p>
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - generalise multiplication problems beyond recalled facts, by looking for patterns - investigate patterns in the multiples of times tables 	<p>P & A 4, 5, 6</p>
<p>form and solve true or false number sentences and open number sentences involving all four operations, using equality or inequality (e.g., $8 \times 7 < 8 \times 5 + 8$ (T or F?))</p>	<p>P & A 4 – rules for 2,5,10 TRUE/FALSE statements through every year level to write</p>
<p>use tables, XY graphs, and diagrams to recognise relationships in a linear pattern, develop a rule in words that identifies the constant amount of change between consecutive elements or terms in the pattern, and predict further elements in the pattern</p>	<p>Measurement 2 - 7</p>
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - investigate inverse operations to find missing numbers in equations and growing patterns (e.g., tivaevae) - explain and justify the relationship between the ordinal position and its corresponding element to find a pattern’s rule - generalise relationships between positive and negative integers using the commutative, associate, and distributive properties of numbers - investigate appropriate situations 	<p>Mathematical processes: 1 P & A 5 Recording with brackets 2 P & A 3 Prime, composites, factors, multiples 3 Will write this 4</p>

<p>Equations and Relationships create and use algorithms for making decisions that involve clear choices (e.g., formulating a familiar routine as a set of step-by-step instructions)</p>	<p>To write P & A 6</p>
<p>use the mathematical processes to: – connect to algorithms for operations – investigate situations that involve making decisions.</p>	
<p>Algorithmic Thinking create and use algorithms for making decisions that involve clear choices (e.g., formulating a familiar routine as a set of step-by-step instructions)</p>	<p>P & A 2 Formula P & A 6 .</p>
<p>use the mathematical processes to connect algorithms with methods for solving an operation.</p>	<p>P & A 6</p>
<p>Measurement Measuring estimate and then accurately measure length, mass (weight), capacity, temperature, and duration, using appropriate metric units or a combination of units</p>	<p>Measurement 1, 2, 4, 5, 7</p>
<p>select and use the appropriate unit and tool for the task and the attribute being measured</p>	<p>Measurement 1, 2, 4, 5</p>
<p>convert between common metric units for length, mass (weight), and capacity; and use decimals to express parts of wholes in measurements</p>	<p>CAL 10 Measurement 6, 7</p>
<p>visualise, measure, and draw (to the nearest degree), the amount of turn in angles up to 360 degrees</p>	<p>Geometry 1</p>
<p>use the mathematical processes to: – connect measuring with place value and decimals, angles with fractions of a circle and degrees of turn, and benchmark fractions with measurements (e.g., 5 0 0 m l = 21 L) – investigate, using practical measuring situations (e.g., using scaled measurement instruments, reading angles using geometric software and protractors) – explain and justify the use of appropriate metric units for a given situation</p>	<p>NNS 3 Measurement 7</p>
<p>Perimeter, Area, and Volume visualise, estimate, and calculate the area of rectangles and right-angled triangles and the volume of rectangular prisms, by applying multiplication</p>	<p>Measurement 3, 4, 7</p>
<p>use the mathematical processes to: - connect area with multiplication arrays and the commutative property of multiplication – generalise the formula for finding the area and volume of rectangles and rectangular prisms – investigate practical contexts for finding perimeter, area, and volume</p>	
<p>Time convert between units of time and solve duration-of-time problems, in both 12- and 24-hour time systems</p>	<p>Measurement 2</p>

<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - connect units of time to fractions - investigate calendars, timetables, and schedules to work out the duration between events, or the start and end times for events. 	CAL 2
<p>Geometry Shapes classify, identify, and explain similarities and differences between: – 2D shapes, including types of triangles – prisms and pyramids</p>	Geometry 3
<p>identify and describe the interior angles of triangles and quadrilaterals</p>	Geometry 1, 3
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - connect angles with turns - investigate the properties of triangles and polygons – investigate line and rotational symmetry - explain and justify whether lines are parallel, and shapes are regular - explain and justify the value of unknown angles in triangles and quadrilaterals 	
<p>Spatial Reasoning visualise and draw nets for rectangular prisms</p>	Numicon 6 Measurement 3
<p>visualise, create, and describe 2D geometric patterns and tessellations using rotation, reflection, and translation, and identifying the properties of shapes that do not change</p>	Geometry 1, 2, 3 Measurement 6
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - connect enlargement with simple grid references or coordinates and with doubling and halving - generalise the properties of shapes that do not change when transformed - investigate nets that fold together, shapes that tessellate, and transformations 	
<p>Pathways - interpret and create grid references and simple scales on maps - use directional language, including the four main compass points, turn (in degrees), and distance (in m, km), to locate and describe positions and pathways</p>	Numicon 4 Geometry 1 – Drawing angles and plotting a route Geometry 3
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> - connect compass points with angles and turns, and grid references with graphing skills - investigate different types of maps. 	
<p>Statistics Problem investigate summary, comparison, and time-series situations, using multivariate data to:</p> <ul style="list-style-type: none"> - pose investigative questions that can be answered with data - make predictions or assertions about expected findings 	Measurement 7 • To read and interpret information from a variety of sources, including lists, tables and line graphs.
<p>use the statistical processes to investigate school-related issues of interest</p>	
<p>Plan plan how to collect primary data or how to use provided data, including identifying the variables of interest and, for provided data:</p>	

<ul style="list-style-type: none"> – identifying who the data was collected from – identifying the original investigator’s purpose for collecting the data – deciding if the source is reputable, by checking if any survey questions appear to be biased towards a particular point of view 	
<p>use the statistical processes to:</p> <ul style="list-style-type: none"> – investigate topics of interest – explain and justify primary and secondary data, sensitive topics or questions, and ethical practices for data collection and use 	
<p>Data</p> <p>describe information about variables in secondary data by using publisher provided data dictionaries (e.g., how data was collected for them and possible outcomes for them)</p>	Measurement 2
<p>use the statistical processes to investigate methods for collecting secondary data</p>	
<p>Analysis</p> <p>create and describe a variety of data visualisations that make meaning from the data, identifying features, patterns, and trends in context, including the variable and group of interest</p>	Measurement 2
<p>use the statistical processes to:</p> <ul style="list-style-type: none"> – investigate appropriate situations – explain and justify using ‘I notice’ statement about data visualisations, selecting the visualisation that best represents the data 	
<p>Conclusion</p> <p>answer the investigative question, comparing findings with initial predictions or assertions and their existing knowledge of the world</p>	Measurement 2
<p>use the statistical processes to:</p> <ul style="list-style-type: none"> - connect statements with data visualisations to answer an investigative question, and to connect initial predictions or assertions with actual findings – investigate appropriate situations 	
<p>Statistical Literacy</p> <p>identify, explain, check, and, if needed, improve features in others' data investigations (e.g., survey questions, misleading information or statements).</p>	Measurement 2
<p>use the statistical processes to investigate, interpret, critique, and check the claims made about data presented in tables, pictographs, bar graphs, line graphs, and pie charts.</p>	
<p>Probability</p> <p>Probability Investigations</p> <p>engage in one-stage, chance-based investigations, including those with not equally likely outcomes, by:</p> <ul style="list-style-type: none"> – posing investigative questions – anticipating what might happen – identifying possible outcomes for the investigative questions – generating all possible ways to get each outcome (a theoretical approach) or undertaking a probability experiment and recording the occurrences of each outcome – creating data visualisations for possible outcomes <ul style="list-style-type: none"> – describing what these visualisations show – finding probabilities as fractions – answering investigative questions – reflecting on anticipated outcomes – comparing findings from probability experiments and associated theoretical probabilities, if the theoretical model exists 	
<p>Critical Thinking in Probability</p>	

interrogate statements that others make about one-stage, chance-based situations, referring to evidence.	
use the statistical processes to: - connect the chance of an outcome occurring with fractions, decimals, and percentages – investigate everyday chance-based situations using physical activities and technology.	