

**New Zealand
Curriculum
Phase 2
Year 4 with
Numicon 3**



2024 Curriculum Phase 2 Year 4 with Numicon 3



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 3* and *Geometry, Measurement and Statistics 3* 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.

NOTE: We recognise that Numicon 3 is appropriate for two year levels: Years 3 and 4. Year 3 will cover the first part of each activity group and Year 4 will cover the remainder and extra activity groups to match the curriculum. This will serve as an excellent opportunity for teachers to consolidate all learning from Phase 1 this providing a strong foundation for future learning.

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 3 Calculating 1 Developing fluency with adding and subtracting to 10.

Terms for children to use

combine, add, plus, total, compare, subtract, take away, minus, difference, equals, single digit, facts, pattern, similar, different, combination, estimate, organize, systematic, group, score

Teaching Materials Featured in this Correlation:

Number, Pattern and Calculating 3 Teaching Pack ISBN 978-0-19-838968-2

Geometry, Measurement and Statistics 3 Teaching Pack ISBN 978-0-19-838969-9

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)

<p>Number Mātauranga tau Number structure count to and within 1,000, from any multiple of 100, forwards and backwards in 25s and 50s</p>	NNS 1, 3 (Consolidation & Extension from Year 3) P & A 3
› recognise the base ten structure of numbers up to 10,000	NNS2 (Consolidation & Extension from Year 3)
identify, read, write, compare, and order whole numbers up to 10,000	NNS 6 (Consolidation & Extension from Year 3)
use the mathematical processes to: – connect with metric units that are powers of 10, and with decimal place value	Numicon 4 NNS 6
<p>Operations use rounding and estimation to predict and to check the reasonableness of calculations</p>	NNS 6 (Consolidation & Extension from Year 3) CAL 13, 14
round whole numbers to the nearest thousand, hundred, or ten, round tenths to the nearest whole number	NNS 6 (Consolidation & Extension from Year 3) CAL 13 and 14
add and subtract 2- and 3-digit numbers	CAL 8, 12, 13, 14
multiply a 2-digit by 1-digit number and two 1-digit whole numbers (e.g., 5×46 ; 8×7)	CAL 10, 15
divide whole numbers by a 1-digit divisor, with no remainders (e.g., $65 \div 5$)	CAL 11, 15
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	The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.
<p>Rational Number identify, read, write, and represent tenths as fractions and decimals</p>	NNS 4

	Numicon 4 NNS 6 Connections with tenths on a number line, then as decimals
compare and order tenths as fractions and decimals, and convert decimals to fractions	Numicon 4 NNS 6 Connections with tenths on a number line, then as decimals
divide whole numbers by 10 to make decimals	Numicon 4 Cal 7 Multiplying and dividing by 10 and 100
for fractions with related denominators of 2, 4, and 8, 3 and 6, or 5 and 10: – compare and order the fractions – identify when two fractions are equivalent – represent the fractions in their simplest form	NNS 7, 8 (Consolidation & Extension from Year 3)
convert, using number lines, between improper fractions and mixed numbers for fractions with denominators of 2, 3, 4, 5, 6, and 10	NNS 8 (Consolidation & Extension from Year 3) Numicon 4 NNS 7
find a unit fraction of a whole number, using multiplication or division facts and where the answer is a whole number (e.g., $1/5$ of 40)	NNS 7 (Consolidation & Extension from Year 3)
identify, from a unit fraction part of a set, the whole set	NNS 7 (Consolidation & Extension from Year 3) Bar modelling – Numicon Online resource
add and subtract fractions with the same denominators to make up to one whole or less than one whole (e.g., $3/8 + 3/8 + 2/8 = 1$)	NNS 7 and 8
add and subtract decimals to one decimal place	Measurement 4 Money
use doubling or halving to scale a quantity (e.g., to double or half a recipe)	CAL 9, 15 Measurement 5
use the mathematical processes to: – 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	The mathematical processes listed (see left) are embedded in the activities above and for all sections described below, to the end of the document.
Financial Maths make amounts of money using dollars and cents (e.g., to make 3 dollars and 70 cents)	NNS 4 CAL 8
estimate and calculate the total cost and change for items costing whole dollar amounts	Measurement 4
use the mathematical processes to: – connect to rounding and addition and subtraction of decimals to two places – investigate making amounts of money, using different denominations – investigate financial plans and decisions.	The mathematical processes listed (see left) are embedded in the activities above and for all

	sections described below, to the end of the document.
Taurangi Algebra Generalising Number Properties use inverse operations to solve multiplication and division problems	P & A 1, 2 Cal 7, 11
explore the associative property with addition and multiplication	P & A 1, 3
recall multiplication and corresponding division facts for 4s, 6s, 9s, and 10s	Cal 5, 6 P & A 2, 3 Numicon 4 - 6's and 9's
explore the distributive property of multiplication over addition (e.g., $7 \times 8 = 7 \times (5 + 3) = (7 \times 5) + (7 \times 3)$)	Cal 10 Numicon 4 P & A 3 Numicon 5
use the mathematical processes to: – generalise multiplication problems beyond recalled facts, by looking for patterns – investigate patterns in the multiples of times tables	P & A 4, 5 CAL 15
Equations and Relationships form and solve true or false number sentences and open number sentences involving multiplication and division, using understanding of the equal sign (e.g., $5 \times _ = 20$; $_ \div 3 = 6$)	P & A 1, 3, 7 True False Cal 14 Measurement 6
recognise and describe the rule for a growing pattern using words, tables, and diagrams, and predict further elements in the pattern	P & A 2, 4 P & A 4
use the mathematical processes to: – 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.	Will write connections to tivaevae etc
Measurement Measuring develop personal benchmarks for estimation and measure length, area, mass (weight), capacity, and duration, using appropriate metric units	Measurement 3, 5, 6
use appropriate units to describe length, mass (weight), capacity, and time	Measurement 3, 5
use the metric measurement system to explore relationships between units	Measurement 3, 4 NNS 6, 8
recognise that angles can be measured in degrees, using 90, 180, and 360 degrees as benchmarks	NNS 6 Measurement 3, 4

<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> – connect measuring with place value and decimals, angles with fractions of a circle and degrees of turn, and benchmark fractions with measurements (e.g., 500ml = 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>Perimeter, Area, and Volume</p> <p>visualise, estimate, and calculate:</p> <ul style="list-style-type: none"> – the perimeter of polygons using metric units – the area of shapes covered with squares or half squares – the volume of shapes filled with centicubes, - taking note of layers and stacking 	Measurement 3
<p>use the mathematical processes to:</p> <ul style="list-style-type: none"> – 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 	Measurement 3
<p>Time</p> <p>tell the time to the nearest 5 minutes, using the language of minutes past the hour and to the hour</p>	Measurement 1, 2
<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. 	
<p>Geometry</p> <p>Shapes</p> <p>identify, classify, and describe the properties of polygons (including triangles and quadrilaterals) using properties of shapes, including line and rotational symmetry</p>	<p>Geometry 1</p>
	Numicon 2 and 4
<p>compare and classify angles in 2D shapes equal to, smaller than, or larger than a right angle</p>	Geometry 2, 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</p> <p>identify the 2D shapes that compose 3D shapes (e.g., a triangular prism is made up of two triangles and three rectangles)</p>	
<p>visualise, predict, and identify which shape is a reflection, rotation, or translation of a given 2D shape</p>	
<p>use the mathematical processes to:</p>	Numicon 4 Geometry 3

<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</p> <p>use grid references to identify regions and to plot positions on a grid map</p> <p>interpret and describe pathways, including half and quarter turns and the distance travelled</p>	<p>Geometry 4</p> <p>Numicon 3 compass points</p>
<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</p> <p>Problem</p> <p>investigate summary and comparison situations with categorical and discrete numerical data, using multivariate (2 or more variables) data, by</p> <ul style="list-style-type: none"> – posing summary and comparison investigative questions that can be answered with data – making predictions or assertions about expected findings 	<p>Measurement 1, 2, 3</p>
<p>use the statistical processes to investigate school-related issues of interest</p>	<p>Measurement 1, 2, 3</p>
<p>Plan</p> <p>plan how to collect primary data to support answering an investigative question, including:</p> <ul style="list-style-type: none"> – deciding on the group of interest – deciding the variable(s) for which data will be collected – taking account of ethical practices in data collection 	<p>Measurement 1, 2, 3</p>
<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>Geometry 3</p> <ul style="list-style-type: none"> • To understand how to create and use Venn, Carroll and tree diagrams.
<p>Data</p> <p>use a variety of tools to collect data, check for errors in the data</p>	<p>Measurement 1, 2, 3</p>
<p>use the statistical processes to investigate methods for collecting secondary data</p>	
<p>Analysis</p> <p>create and describe data visualisations for summary and comparison investigations that make meaning from the data, with statements including the names of the variable</p>	<p>Measurement 1, 2, 3</p>
<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>choose the best descriptive statements to answer the investigative question, reflecting on findings and how they compare with initial predictions or assertions</p>	<p>Measurement 1, 2, 3</p>
<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 check the statements that others make about data to see if they make sense, using information to clarify or correct statements where needed.</p>	Measurement 1, 2, 3
<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 Probability Investigations engage in chance-based investigations with equal 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 (theoretical approach) or undertaking a probability experiment and recording the occurrences of each outcome – creating data visualisations for possible outcomes – describing what these visualisations show – finding probabilities as fractions – answering investigative questions – reflecting on anticipated outcomes 	P & A 5
<p>agree or disagree with others' conclusions about chance-based investigations</p>	P & A 6
<p>use the statistical processes to:</p> <ul style="list-style-type: none"> – connect the chance of an outcome occurring with fractions, decimals, and percentages – investigate everyday chance-based situations using physical activities and technology. 	