Welcome to Numicon

numicon

The Numicon Approach

Quality, whole school, structured maths programme

Phase 1

Years 0 & 1
Online teaching
files (Firm Foundations)

Years 2 & 3
Online teaching files (Numicon)
Apparatus as shown per class

Phase 2

Years 4, 5 & 6
Online teaching files

Numicon – All

Student Investigations books

Apparatus as shown per class

Phase 3

Years 7 & 8
Online teaching files

Numicon – All

Student Investigations books

Apparatus as shown per class

Extra Numicon Shapes, Pegs, Baseboard and Cuisenaire rods

Science of Learning using…

numicon ®

Numbers and the Number System	1	Finding how many by grouping in 10s and 100s
Calculating	2	Developing fluency with adding and subtracting facts to 2
Numbers and the Number System	2	Exploring hundreds, tens and units with base-ten apparatus
Numbers and the Number System	5	Ordering and structuring numbers to 1000
Calculating	8	Adding and subtracting multiples of 10 and 100
Calculating	9	Patterns of similar adding and subtracting calculations
Pattern and Algebra	3	Reading and creating scales with different intervals
Numbers and the Number System	6	Finding half way, rounding to the nearest 10 or 100
Measurement	3	Measuring accurately and calculating with metres, centimetres and millimetres
Measurement	4	Calculating with dollars and cents, and handling money
Measurement	5	Measuring and calculating with grams and kilograms
Measurement	6	Measuring and calculating with litres and millilitres

February/March

May/June

August

October

December

Sequenced & Explicit

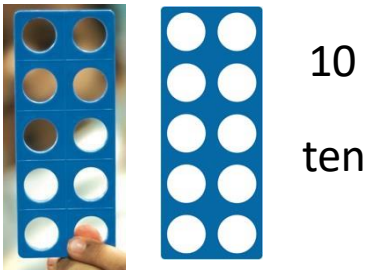6: Expressing remainders as decimals when sharing or grouping   Quit activity ✕

Intro | Links | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | +

Step 1

Recall with children how to carry out a sharing dividing calculation and express the remainder as a fraction, e.g. in Activity 5 they worked out that $3268 \div 16 = 204$ r4, then continued to divide the remainder by 16 and express this as a simplified fraction, giving $204\frac{4}{16} = 204\frac{1}{4}$.
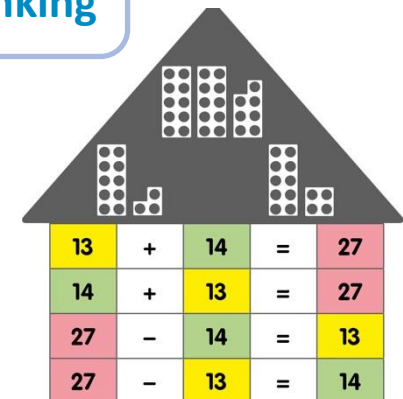
Concrete, Pictorial Abstract & Language

10

ten

Making connections

2 x 5
2 x 10
5 x 100

0   10 cm   20 cm

½ kg

100 g
100 g
100 g
100 g
100 g
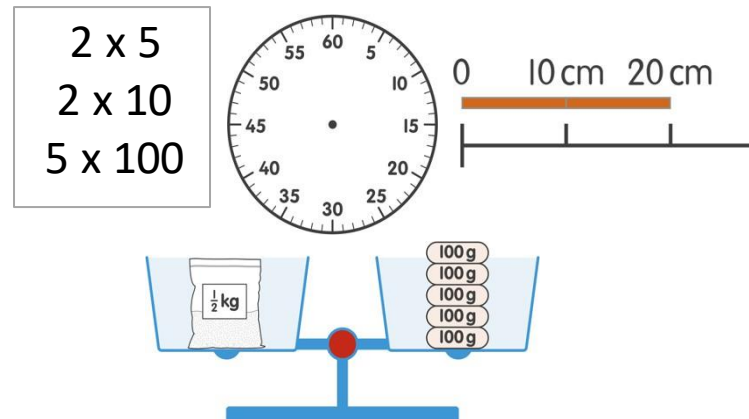
Working systematically & Mathematical thinking

13	+	14	=	27
14	+	13	=	27
27	−	14	=	13
27	−	13	=	14

Numicon & the New Zealand Curriculum

Years	0/1	2	3	4	5	6	7	8	9/10
Phases		1			2			3	4
Numicon Books	FF	1	2	3	4	5	5/6	6	
Intervention T 3	Breaking Barriers								
Intervention T 2		Intervention Programme							
Catch-up						Big Ideas			

Year 4's at Year 1/2 level?
- Teach from Numicon 3 onwards

Year 5 & 6's at Year 3 level?
- Teach from Numicon 3/4 onwards

Year 7 & 8's are at Year 3 level?
- Teach from Numicon 3/4 onwards

Student workbooks are not required

Maths is not about learning to fill in a worksheet…

- Maths is the language of patterns and relationships. Children love to communicate.

- Experience has shown that students and teachers disengage when provided with workbooks/worksheets to complete. (Reference: Education Endowment Foundation, UK)

- Focus on learning - students truly understand mathematical concepts using manipulatives and investigation.

- A huge saving in the school budget!

Active Learning

Manipulatives are key

Scaffolds learning including at Secondary level

Enables deep understanding of maths concepts

Successful implementation - 'Make it Count' plan

- Teen numbers
- Odds & evens
- Partitioning exploration
- Year 6

numicon
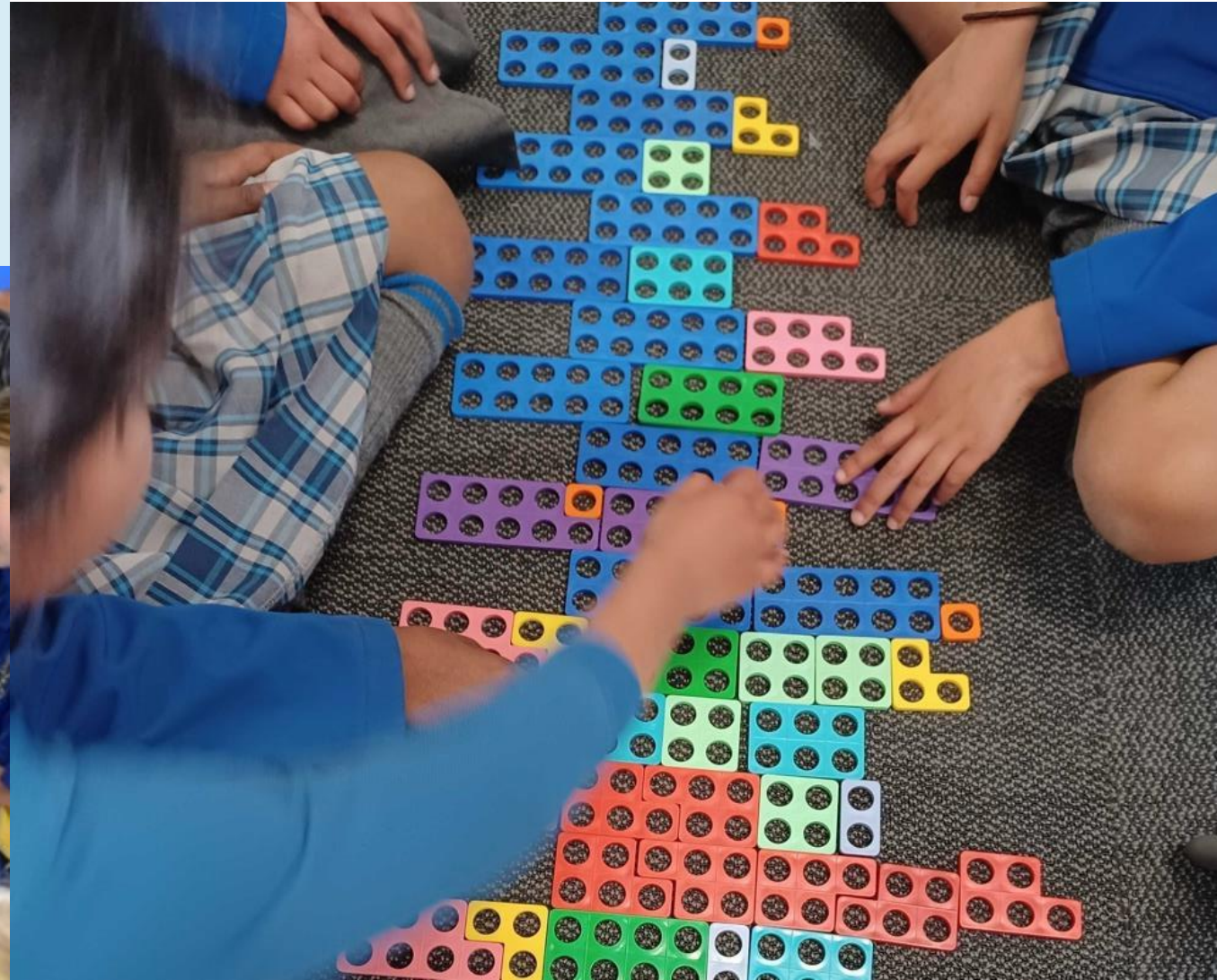
Well-resourced, complete school programme

Online
Teaching Handbooks
& Assessment Resources
Years 0 - 8

Printed
Student problem-solving books
Years 4 - 8

Manipulatives

Online Teaching Handbooks

Resources for in-class teaching, games, software
for teaching, assessment, teacher support videos

Tens | Ones
Tens | Ones

Numicon at the Seaside
by Rachel Hussain
illustrated by Mary Kilvert
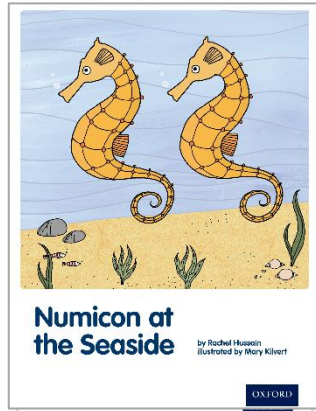
Interactive Whiteboard Software Teaching Ideas

Using arrays to explore the commutative property of

IWB ideas: Using arrays to explore the commutative property of multiplying

How you can use the Numicon IWB to explore the commutative property with arrays (3 mins 59 secs)
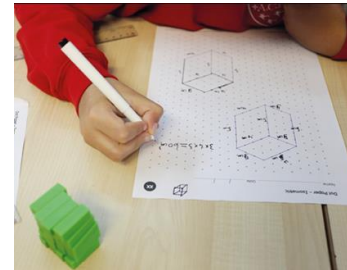
Set the scene again: a theatre cafe has 6986 ml of juice concentrate and every 56 ml makes 1 ℓ of a juice drink. Ask children to work out how many litres of the drink can be made.

Name .... Date ..../..../....

Number Stars

Play

	1	2	4	•	7	5	
5	6	)	6	9	8	6	
		5	6	0	0		(56 × 100)
		1	3	8	6		
		1	1	2	0		(56 × 20)
			2	6	6		
			2	2	4		(56 × 4)
				4	2		($\frac{42}{56} = \frac{3}{4}$)

Numicon 6 Planning

If you subscribe to Numicon Online or have copies of the *Numicon 6 Teaching Handbooks*, the summaries and links in this document will help you to get the most out of these.

You can follow *Numicon* as a complete teaching programme using the long-term plan provided here.

You can also dip into the rich bank of activities and resources to supplement your teaching. Pick a topic on the long-term plan, click on it for details and to open it in the online handbook.

Contents
Click on any link below to go straight there!

Long-term plan — Page 2

This long-term plan shows you the recommended order for teaching the Numicon 6/P7 Activity Groups over the school year. It includes links to the summary information for each unit and links to open those activities in the online handbooks. Milestone markers on the plan take you to the skills and understanding children need to be secure in to help them progress.

Details for each unit of learning — Page 5

These are summaries for each unit. They follow the order in the long-term plan and list every activity in the unit. Log into your subscription to Numicon Online first, then click on any activity to open it in the online handbook. When you're in the online handbook you can go to the Links tab and download the accompanying resources, including Explorer Progress worksheets, photocopy masters and Explore More homework.

Assessment support — Page 31

Milestone statements help you assess progress throughout the year and inform your teaching and planning. They indicate the skills and understanding children need to be secure in as they progress through the teaching programme before they are able to successfully meet new ideas. This page includes a link to the set of question cards that can be used for assessment or self-assessment and to a tracking spreadsheet to help you record that information.
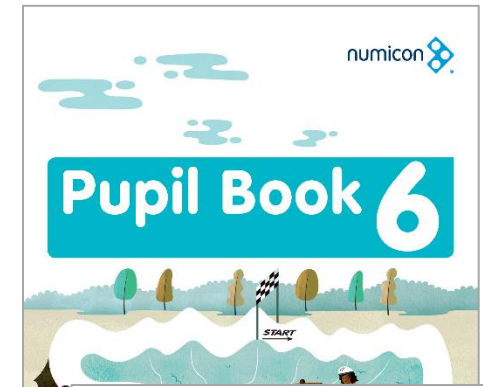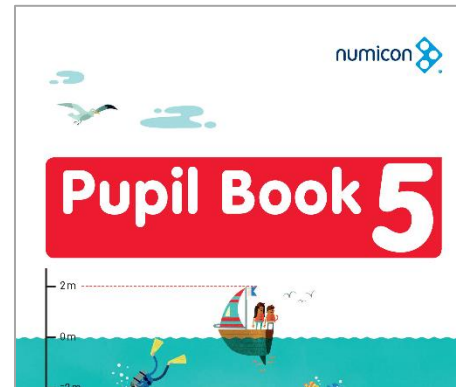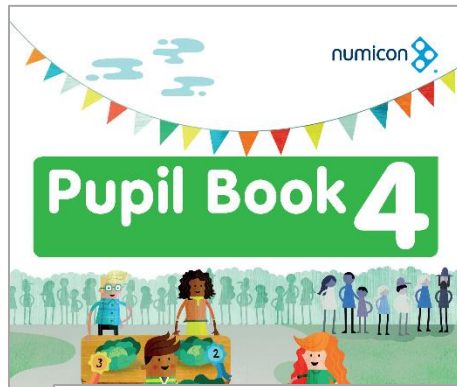
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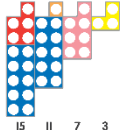
Years 4 – 8 Student Textbooks

Investigation, Critical thinking with Going Deeper

Pupil Book 3

Pattern and Algebra 4•5

Sequences with decreasing patterns

This is a decreasing pattern.

15   11   7   3

Practice

1 What is the rule for Ben's sequence?

2 Can you find the rules for these sequences?
   a 35, 30, 25, 20, 15, 10, 5   b 41, 36, 31, 26, 21, 16, 11
   c 151, 146, 141, 136, 131, 126, 121

3 Can you extend these sequences to find the 10th term?
   a 36, 33, 30, 27, …   b 51, 49, 47, 45, 43, …

4 Can you explain the rule for each sequence in question 3?

Going deeper
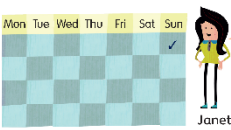
1 Can you find the 5 missing terms in each of these sequences? Explain how you know.
   a ▢, ▢, ▢, ▢, ▢, 43, 41, 39, 37, 35, 33
   b ▢, ▢, ▢, ▢, ▢, 26, 24, 22, 20, 18

2 Can you make your own decreasing sequences? Challenge your partner to find the rule.

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Pupil Book 4

Pattern and Algebra 4•3

Lowest common multiples

I jog every 5 days.
Mon Tue Wed Thu Fri Sat Sun
I jog every 3 days.

Kamal   Janet

Practice

1 Kamal and Janet both start jogging on a Sunday. On which day of the week will they both jog on the same day again?

2 Can you use Numicon Shapes or number rods to check your answer to question 1?

3 Get a set of number cards from 2 to 12. Take turns to choose two of the cards and work out their Lowest Common Multiple (LCM). Try this five times each and agree your answers.

Going deeper

1 The LCM of two numbers less than 10 is 12. Can you work out which numbers these are, and explain how you know? Is this the only correct answer?

2 The LCM of two numbers is 18. Can you work out which pairs of numbers these could be? How many different number pairs are possible? Can you explain how you know?

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Pupil Book 5

Measurement 5•4

Side length, area and perimeter

Practice

1 Look at the enclosed rectangle above, made with two 10-rods and two 4-rods. Can you work out the area and perimeter of the shape in terms of rods?

2 What would the area and perimeter of each rectangle be in terms of rods, if you enclosed a rectangle using:
   a two 9-rods and two 5-rods   b four 5-rods and two 2-rods
   c six 2-rods and two 9-rods?

Going deeper

1 Here are some rectangles with the area of each written in the middle. Can you work out the length of each missing side?

   a 2 / 5 / ?
   b x / x^2 / ?
   c 5 / $10h$ / ?
   d ? / 240 / 12

2 a How would you work out the perimeter of each rectangle above?
   b For each one, can you find a different rectangle with the same perimeter?

Explorer Progress Book 5, pages 16–17

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Pupil Book 6

Pattern and Algebra 3•5

Finding all possibilities

The vehicles in this car park have 36 wheels in total.

Practice

1 Using number rods, can you suggest how many bicycles and how many cars might be in the car park? How many different possibilities can you find?

2 If there were 15 vehicles altogether, how many of these were cars and how many were bicycles do you think? Can you explain?

3 Can you write down the relationship between the numbers of bicycles and cars, and the number of wheels? Use W to stand for the number of wheels, a to stand for the number of bicycles and b to stand for the number of cars.

Going deeper

1 If the car park attendant counted a total of 52 wheels and 21 vehicles (cars and bicycles) altogether, how many do you think were cars, and how many were bicycles?

2 Can you explain your strategy for working out the answer to question 1? Do you have to calculate 'wheel totals' for every possible pair of numbers from (1, 20) through to (20, 1), or can you rule out some possible pairs without needing to find a total?

Explorer Progress Book 6b, pages 16–17

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Manipulatives Phase 1 Years 0 & 1

Per class...

Years 0 & 1
FIRM FOUNDATIONS

Apparatus as shown

and more...
Numicon shapes
Cuisenaire rods
Baseboards
Numicon Pegs

Manipulatives Phase 1 Years 2 & 3

numicon

Per class…

Years 2 & 3

Apparatus as shown

and more…
Numicon shapes
Cuisenaire rods
Baseboards
Numicon Pegs

Manipulatives Phase 2

Per class…

Years 4 & 6

Apparatus as shown

and more…
Numicon shapes
Cuisenaire rods
Baseboards
Numicon Pegs

Manipulatives Phase 3

numicon

Per class…

Years 7 & 8

Apparatus as shown

and more…
Numicon shapes
Cuisenaire rods
Baseboards
Numicon Pegs

Teacher Support

Oxford Owl

Numicon in use in the classroom

Using the published resources in the classroom with Derry Richardson (6 min 20 sec)

Play

An activity in action

An example of Numicon in use in the classroom, with Derry Richardson (5 min 12 sec)

Play

Numicon NZ Website

numicon affiliate programme

Award-winning whole-school maths resources

Edushop webinars

EDUSHOP

Online PLD – Free webinars:

- Using the online resources
- Using the manipulatives
- Getting Started

Supporting Teachers

1. Building teacher knowledge

2. Explicit teaching

3. Step-by-step

4. CPA approach

5. Manipulatives and apparatus

6. Students and teachers - engaging

7. An inclusive approach
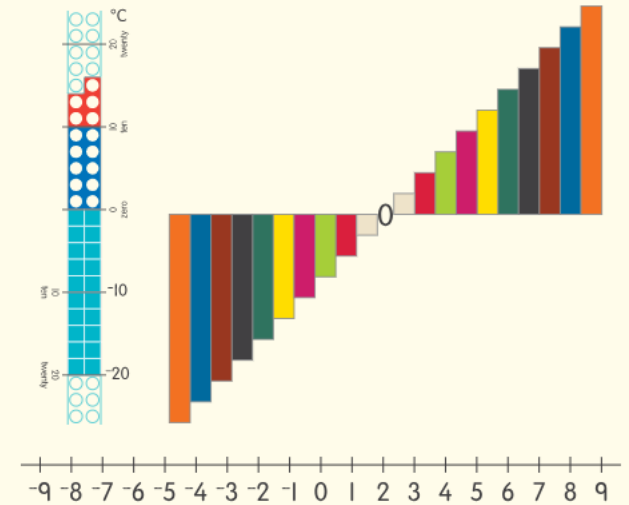
Results

Key findings:

- Schools that have invested in ongoing PD have the best results

- Teachers appreciate the flexibility within the structure

- Children are engaged – behaviour problems reduced

- Parents are very pleased

Results

Year 8 Cohort

Progress even during the Covid lockdowns

Your decision...

Phase 1

Years 0 & 1
Online teaching files
(Firm Foundations)

Years 2 & 3
Online teaching
files (Numicon)
Apparatus as shown per class

Phase 2

Years 4, 5 & 6
Online teaching files

Numicon – All

Student Investigations books

Apparatus as shown per class

Phase 3

Years 7 & 8
Online teaching files

Numicon – All

Student Investigations books

Apparatus as shown per class

And more
Numicon Shapes, Pegs, Baseboards, Cuisenaire rods