

# A structured approach to teaching Maths

Using the principles of mastery



Create a class full of  
mathematical thinkers



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# 1

## What is Numicon?

The Numicon approach encompasses three key elements:



Every student in your class will succeed in maths and have fun!

Numicon is a maths lab where children are talking, exploring, making connections, reasoning and solving problems together.

The whole class is learning the same concept together with all children being included, the access being differentiated to meet all needs.

Maths concepts are abstract, making them difficult to explain and understand. The Numicon shapes, Cuisenaire rods, Place Value blocks and other apparatus enable children to explore, understand and communicate their thinking.

# 2

## Mastery

- Consistency and rich development across the school.
- Cyclic teaching sequence aiding memory, developing deeper understanding in the Scope and Sequence.
- Explicit teaching – small accessible and incremental steps building knowledge with links to everyday life.
- Deep conceptual understanding, confident procedural thinking and strong language development.
- Concrete-pictorial-abstract and language approach to the teaching encourages conversation and connections within maths that would otherwise be very abstract.

**Numicon teaching progression: Number, Pattern and Calculating 5 and Geometry, Measurement and Statistics 5**

The Numicon teaching progression is split into 100 activities which are sequenced over the school year and the progression is split into 10 activity groups. Detailed work has been outlined within the scope and sequence for the first 10 activity groups. The progression has been planned to support the development of children's understanding of the key concepts of the curriculum and to provide a framework for the progression of children's learning.

Scope and Activity Group Number	Activity Group Title
1	Counting
2	Counting
3	Counting
4	Counting
5	Counting
6	Counting
7	Counting
8	Counting
9	Counting
10	Counting

Numicon takes all the stress away!



# 3

## Explicit Teaching

Guidance for teachers provides support and opportunities for creative adaptations to develop deep understanding and effective communication. This builds confidence for everyone. Notice, Recognise and Respond are all there!

### Activity 2: Cover the Baseboard with Numicon Shapes

#### Step 1

Explain that 'Cover the Baseboard' is a puzzle where children have to fill the Baseboard with Shapes. As children work, listen for what they call the Shapes. Some may work systematically, others may work haphazardly. Some will readily rotate and flip Shapes to fit spaces, others may have more difficulty. Some will pick a Shape to fit a space exactly without hesitating, and some will engage in more complex problem solving as they anticipate future moves. Listen for children describing position and movement.

#### Step 2

Set children a further 'detective' challenge to find out if it is possible to cover the Baseboard with just one sort of Shape and, if so, which Shapes can be used. Listen for children



### Activity 6: Counting in powers of 10

#### Step 1

Make a 5- or 6-digit number, e.g. 44 503, with interlocking cubes, arranging them in columns using the points system in the image. Ask children what would happen if one more cube was added to any column. Look and listen for children who can explain how the column and quantity value would change.

#### Step 2

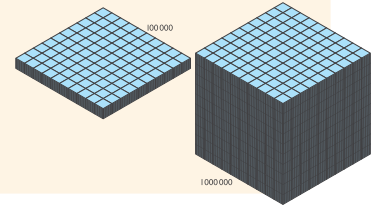
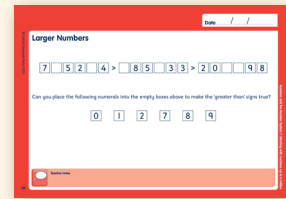
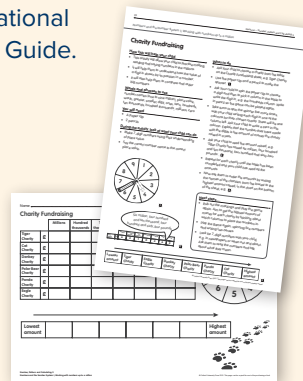
Ask children how we could use cubes to help us count on from the number in steps of 1000. Agree to add blue cubes one at a time. Work with children to do this, counting 44 503, 45 503, ..., 49 503; stop before counting over the column boundary. Look and listen for children who can explain that only the thousands digit is changing.

# 4

## Teaching Guidance

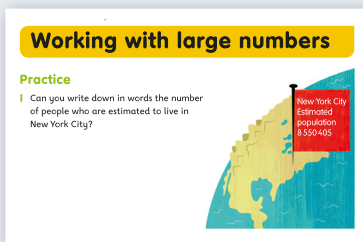


- Teacher support in the Educational Context and Implementation Guide.
- Language focus this week.
- Assessment Opportunities – Look and listen for...
- Games and activities to reinforce learning.
- Explore More – for deeper learning at home to generalise.



# 5

## Investigations and Problem solving



Pupil Books to extend and deepen learning.



Independent activities, recording learning and playing games with each other, designed to develop fluency and confidence.



# 6

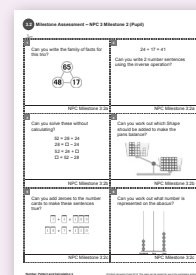
## Assessment



Explorer Progress – evidence of learning this week & the concept applied to other problems.

Statement	None	1	2	3	4	5	6
By this year children should be able to:							
• Perform mental addition and subtraction facts of all numbers to 100	None	C	C	C	C	C	C
• Perform mental addition and subtraction facts of all numbers up to three when using any base ten materials	None	C	C	C	C	C	C
• Multiply and divide mentally using simple multiplication facts	None	C	C	C	C	C	C
• Add and subtract mentally using simple addition and subtraction facts for any bases to 100 and mentally using simple multiplication facts	None	C	C	C	C	C	C
• Understand the relationship between multiplication and division	None	C	C	C	C	C	C
• Use a variety of mental strategies to solve problems	None	C	C	C	C	C	C
• Solve a simple multiplication of numbers of more than 100 objects	None	C	C	C	C	C	C
• Count and order multiples of 100 and multiples of 1000	None	C	C	C	C	C	C
• Read, write and order (up to 1000) 2 and 3 digit numbers	None	C	C	C	C	C	C
• Round whole and decimal numbers to the nearest 10, 100 and 1000	None	C	C	C	C	C	C
• Round numbers and place value notation to say the value of each digit in large numbers	None	C	C	C	C	C	C
• Understand the relationship between multiplication and division	None	C	C	C	C	C	C
• Explain how three related numbers are connected through the inverse relation and order of the related addition and subtraction facts	None	C	C	C	C	C	C
• Use understanding of equivalence, the "=" symbol and knowledge of the inverse relation between addition and subtraction to solve problems when the equals sign symbol appears on either side	None	C	C	C	C	C	C
• Understand the use of area in a plane figure	None	C	C	C	C	C	C
• Know that multiples of 10 and 100 are important relationships on the number line	None	C	C	C	C	C	C

Class tracking of the learning progressions over time.

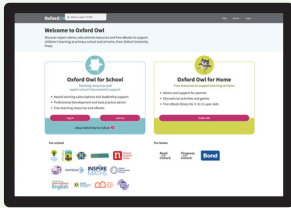


Questions to respond to demonstrating understanding and reasoning.

# 7

## Teaching Resources

### The core programme in print and online



Online resources include planning, assessment, PLD information and videos, lesson guidance videos, software that students and teachers can access.



# 8

## Maths Curriculum links with Numicon

Year	0/1	2	3	4	5	6	7	8	9/10
Phases	1			2			3		4
Numicon Levels	FF	1	2	3	4	5	5/6	6	
Intervention Tier 3	Breaking Barriers								
Intervention Tier 2		Intervention Programme							
Senior Catch-up						Big Ideas			



# 9

## Results

### Wigram School

Everything we set out to achieve has been met! We are extremely happy and proud to be using Numicon. One of our first priorities was to close 'the gap' and lift the 'tail end' of achievement. Every year group has done exactly that.

### St Patrick's School

We have successfully met our original aim of raising engagement and enjoyment in mathematics. We are proud of our school for persevering through this journey. We are reaping the rewards in every way.



Full PLD is provided by arrangement along with purchase options for Numicon and other educational products.

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