

Numicon teaching progression: Number, Pattern and Calculating 2 and Geometry, Measurement and Statistics 2

The Numicon teaching progression chart gives an overview of the expected coverage over the school year and the recommended order for teaching the activity groups. (Statistics work has been included within the Geometry and Measurement activity groups through appropriate contexts.)

See the long- and medium-term planning documents for Number, Pattern and Calculating 2 and Geometry, Measurement and Statistics 2 for references to assessment milestone statements; a fantastic tool for measuring children's progress.

Strand and activity group number	Activity group title
Getting Started	Getting started with Number, Pattern and Calculating 2
Numbers and the Number System 1	Counting to 100 and beyond
Pattern and Algebra 1	Exploring different patterns
Calculating 1	Adding and writing adding sentences
Calculating 2	Subtracting and writing subtracting sentences
Numbers and the Number System 2	2-digit numbers
Calculating 3	Ordering adding and subtracting facts
Pattern and Algebra 2	Exploring the inverse relationship between adding and subtracting within 10
Numbers and the Number System 3	More 2-digit numbers
Numbers and the Number System 4	Comparing and ordering numbers to 100
Pattern and Algebra 3	Exploring equivalence – introducing empty box notation
Measurement 1	Introducing centimetres
Calculating 4	Adding and subtracting whole tens
Geometry 1	Making and classifying polygons
Geometry 2	Identifying the faces, edges and vertices of solid 3D shapes
Calculating 5	Adding and subtracting 1 and 10
Geometry 3	Investigating symmetry
Pattern and Algebra 4	Odd and even
Calculating 6	Partitioning into tens and units to answer adding and subtracting problems
Pattern and Algebra 5	Patterns and sequences of 2s, 3s, 5s and 10s
Calculating 7	Adding and subtracting 1-digit numbers to and from 2-digit numbers

Strand and activity group number	Activity group title
Measurement 2	Introducing the 20p, 50p and £1 coins
Measurement 3	Introducing the £2 coin and the £5, £10 and £20 notes
Calculating 8	Introducing multiplying as repeated adding
Calculating 9	Learning times tables and about multiplying through arrays
Numbers and the Number System 5	Rounding
Calculating 10	Mental strategies for near doubles and adding and subtracting 9
Calculating 11	Bridging through multiples of 10
Geometry 4	Recognizing and naming prisms and cylinders
Calculating 12	Adding three or more 1-digit numbers
Calculating 13	Adding and subtracting 2-digit numbers to 100
Measurement 4	Introducing metres
Calculating 14	Adding and subtracting to 20
Calculating 15	Introducing dividing as ‘How many ... in ... ?’
Pattern and Algebra 6	Logic
Calculating 16	Halves, quarters and thirds of wholes
Pattern and Algebra 7	Finding all possibilities
Numbers and the Number System 6	Introducing fractions as numbers – building on earlier work on fractions as operators (NPC2, Calc16)
Measurement 5	Introducing kilograms and grams
Measurement 6	Introducing litres and millilitres, and units of temperature
Measurement 7	Telling the time and adding and subtracting with units of time
Geometry 5	Investigating and describing rotation

Getting Started: Getting started with Number, Pattern and Calculating 2

Key mathematical ideas Counting, Place value, Grouping, Mathematical thinking and reasoning

Educational context

This group of activities is designed to help all children make the connections between Numicon Shapes and Numicon Shape patterns, number rods, number names and numerals that support children as they work with Numicon. Depending on children's previous experiences, you may need to allow up to two weeks to cover these activities. Activities 1, 5 and 8 and the corresponding independent practices are for children meeting Numicon Shapes and/or number rods for the first time. These children are likely to need more time on the remaining activities than those who have worked with Numicon before. Some may need to repeat Activity 3, until they can quickly and accurately build the Numicon Shape pattern for each Numicon Shape and label it with its number name without counting. Children who are familiar with Numicon are likely to benefit from revising the activities involving number rods.

The activities provide opportunities to observe how children approach their mathematics work, and assess their reasoning and their understanding of cardinal and ordinal number ideas.

Learning opportunities

- To instantly link the Numicon Shapes with number names and numerals.
- To notice patterns in number relationships reflected in physical materials and imagery.
- To learn to describe number relationships using the words and terms for use in conversation.

Words and terms for use in conversation

number names (one, two...), pattern, next, before, after, in between, ordinal number words, words for comparing (small, smaller than, smallest, long, longer than, longest, big, bigger than, biggest, more than, less than, few, fewer than, fewest), set, equal, visualize

Assessment opportunities

Look and listen for children who:

- Use the words and terms for use in conversation effectively in discussion.
- Refer to Numicon Shapes and number rods using cardinal number names.

- Notice patterns in the ordered sequence of Numicon Shapes and use these to predict what the next Shape in the sequence might look like.
- Build Numicon Shape patterns with objects, without counting.
- Consistently order the Numicon Shapes and/or number rods and label them with number names and numerals.
- Describe relationships between the Numicon Shapes or the number rods using words for comparing.
- Build teen numbers with Numicon Shapes and number rods, name them and label them with numerals.

Explore More Copymaster 1: Star Numbers

After completing work on this activity group, give small focus groups of children their Explorer Progress Books and ask them to work through the challenges on the pages. As children complete the pages, assess what progress they are making with the central ideas from the activity group. Refer to the assessment opportunities for assistance.

Focus activities

1. Exploring the Numicon Shapes
2. Cover the Baseboard with Numicon Shapes
3. Building Numicon Shape patterns
4. Drawing Numicon Shape patterns
5. Exploring the Numicon Display Number Line
6. Building, naming and ordering numbers 0–20 with Numicon Shapes
7. Looking at the structure of numbers to 20
8. Exploring number rods
9. Naming number rods and labelling them with numerals
10. Building, naming and labeling numbers to 20 with number rods
11. Describing relationships between Numicon Shapes/number rods (essential preparatory work for Activity 12)
12. What Shape/rod is in the Feely Bag?

Milestone 1	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Milestone 6	Milestone 7	Milestone 8	Milestone 9	Milestone 10
By this point, children should be able to: Recite number names in order to 100, and beyond. Know which numbers come before and after any number in their counting range. Give a sensible estimate up to 50. Know that grouping objects into tens is a more efficient way of finding ‘how many?’ than counting in ones. Use counting in everyday situations. Identify and represent numbers 0–30 and beyond using Numicon Shapes, number rods, numerals and number lines. Order Numicon Shapes and describe relationships between them Spot regularities in sequences and predict from them.	Read, say and build 2-digit numbers confidently from seeing numerals to 40. Build (using Shapes and rods) and write a 2-digit number confidently from hearing its number name to 40. Name and write the numerals from seeing it built with Numicon Shapes. Understand the term ‘multiple of 10’ and the structure of a multiple of 10. Understand when and how to add; illustrate with structured apparatus, adding without counting in ones and writing appropriate number sentences using ‘+’ and ‘=’. Understand the commutative property, i.e. that numbers can be added in any order and the total remains the same. Know that subtracting number sentences can represent different subtracting situations, e.g. ‘take away’ or ‘comparing to find the difference’, and know when to subtract. Illustrate a subtracting story with objects and structured apparatus, subtracting without counting in ones, and saying and writing the number sentence using ‘−’ and ‘=’.	Group: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____							
By this point, children should be able to: Recite number names in order to 100, and beyond. Know which numbers come before and after any number in their counting range. Give a sensible estimate up to 50. Know that grouping objects into tens is a more efficient way of finding ‘how many?’ than counting in ones. Use counting in everyday situations. Identify and represent numbers 0–30 and beyond using Numicon Shapes, number rods, numerals and number lines. Order Numicon Shapes and describe relationships between them Spot regularities in sequences and predict from them.	Read, say and build 2-digit numbers confidently from seeing numerals to 40. Build (using Shapes and rods) and write a 2-digit number confidently from hearing its number name to 40. Name and write the numerals from seeing it built with Numicon Shapes. Understand the term ‘multiple of 10’ and the structure of a multiple of 10. Understand when and how to add; illustrate with structured apparatus, adding without counting in ones and writing appropriate number sentences using ‘+’ and ‘=’. Understand the commutative property, i.e. that numbers can be added in any order and the total remains the same. Know that subtracting number sentences can represent different subtracting situations, e.g. ‘take away’ or ‘comparing to find the difference’, and know when to subtract. Illustrate a subtracting story with objects and structured apparatus, subtracting without counting in ones, and saying and writing the number sentence using ‘−’ and ‘=’.	Group: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____ Name: _____							
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Preparation and check lists

Day 1 – Focus Teaching Activity 1 - Have ready:

- Numicon shapes (empty them out of the boxes into a large plastic container)
- Extra 10- shapes
- Numicon Baseboards
- Numicon pegs
- Numeral cards 1-10 cut from Photocopy Master (PCM) 25

Day 1 – Activity 2 - Have ready:

- Numicon shapes
- Numicon Baseboard

Day 2 – Activity 3 - Have ready:

- Numicon shapes
- Feely Bags
- Numicon Counters and Numicon pegs
- Interactive Whiteboard software – optional
- Magnetic board and magnetic strip - optional

Day 2 – Activity 4 - Have ready:

- Numicon shapes
- Paper baseboards from PCM 9
- Students' exercise books with usual grid lines
- Colouring Pencils
- Explore More Copymaster 1 - Star Numbers

Day 3 – Activity 5 - Have ready:

- Numicon shapes
- Cuisenaire rods
- Empty Number line cut from PCM 15
- Numicon Display Number Line
- Colouring Pencils
- Numicon Interactive Whiteboard Software - optional

Day 3 – Activity 6 – Have ready:

- Numicon shapes
- Number word cards cut from PCM 24
- Numeral cards – from PCM 26
- Numicon Interactive Whiteboard Software - optional

Day 3 – Activity 7 – Have ready:

- Numicon shapes
- Numicon Display Number Line
- Number word cards cut from PCM 24
- Numeral cards – from PCM 26
- Numicon Interactive Whiteboard Software - optional

Day 4 – Focus Teaching Activity 8 - Have ready:

- Numicon shapes (empty them out of the boxes into a large plastic container)
- Extra 10- shapes
- Numicon Baseboards
- Numicon pegs
- Numeral cards 1-10 cut from Photocopy Master (PCM) 25

Day 4 – Activity 9 - Have ready:

- Numicon shapes
- Numicon Baseboard

Day 4 – Activity 10 - Have ready:

- Numicon shapes
- Feely Bags
- Numicon Counters and Numicon pegs
- Interactive Whiteboard software – optional
- Magnetic board and magnetic strip - optional

Day 5 – Activity 11 - Have ready:

- Numicon shapes
- Paper baseboards from PCM 9
- Students' exercise books with usual grid lines
- Colouring Pencils
- Explore More Copymaster 1 - Star Numbers

Day 5 – Activity 12 – Have ready:

- Numicon shapes
- Numicon Display Number Line
- Number word cards cut from PCM 24
- Numeral cards – from PCM 26
- Numicon Interactive Whiteboard Software – optional
- Explore Progress books – pages 2 and 3 for each student to complete in their independent activities

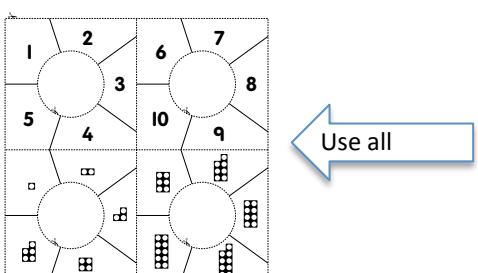
Please note: Take two weeks if necessary- don't be rushed through these foundational activities

Independent Activities Summary:

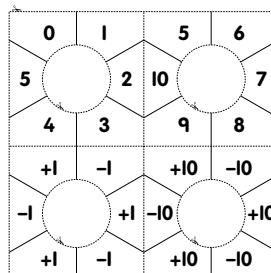
- Individual work for most of the activities are repeats or extensions of what the students have done in the Focus Teaching Activities
- The apparatus is the same as the activity groups, except for needing spinners and the overlays PCM 37 and 38

Spinner Overlays 1 37

38 Spinner Overlays 2

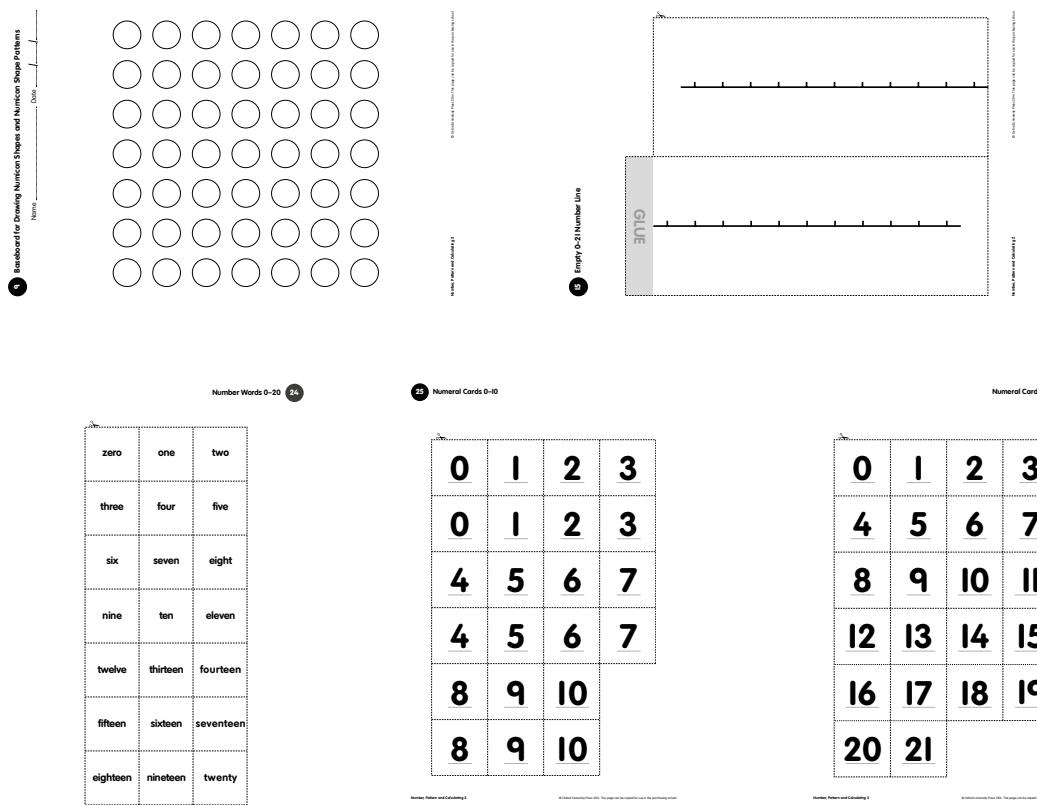


Use all

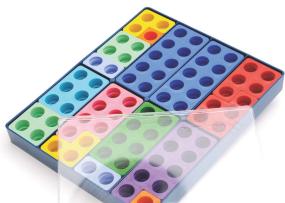


Use the top two

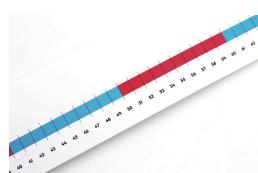
Photocopy Masters 9, 15, 24, 25 and 26 (PCM)



Apparatus



Numicon shapes



0-100 Number line



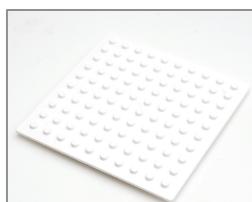
Numicon Display number line



Pegs & Counters



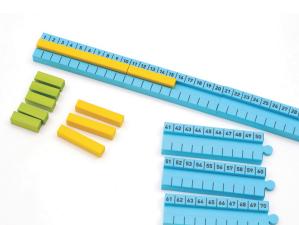
Numeral cards



Baseboard



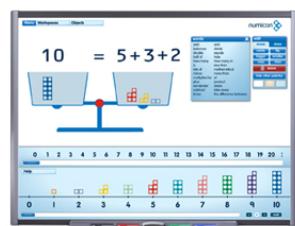
Cuisenaire Rods



Number rod track



Feely Bag



Numicon Interactive Whiteboard Software

Strand and title:

		Date:				
		Monday Class Warm-up:	Tuesday Class Warm-up:	Wed Class Warm-up:	Thurs Class Warm-up:	Friday Class Warm-up:
Short-term planning						
Activity groups						
Learning opportunities for the class		•				
Words and terms for use in conversation						
Assessment opportunities		Look and listen for children who: •				
Focused Group Work						
Independent Work						
Plenary- Whole class						
Resources		Homework: Explore More pp.				Assessment: Explorer Progress pp.