

# Introducing the *new* Firm Foundations

Play-based learning with richer content for children aged 3-5, making this a excellent programme for transition to school, with the latest best practice

## Numicon Firm Foundations



# New Numicon\* Firm Foundations...

Available from July

- Teaching Pack
- Apparatus Packs –  
Group and 1:1 options
- Numicon Online support
- Foam Shapes
- Pan balances
- Software for IWB

Learning Through  
Play

## Numicon Firm Foundations



## Indoor and outdoor Child-initiated balanced with adult-led activities





## Ages 3 – 5 - Early childhood – New Entrants

### Firm Foundation covers:

- Numbers 0–20
- doubling, halving, sharing
- part/whole relationships
- equivalence – comparing two groups
- Geometry interwoven - 2D and 3D shapes
- Measurement interwoven - size, distance, money, weight, capacity, time...



e.g. – ‘equals’ introduced with length in AG6, 2D and 3D shapes, symmetry link with doubling



## Ages 3 – 5 - Early childhood – New Entrants

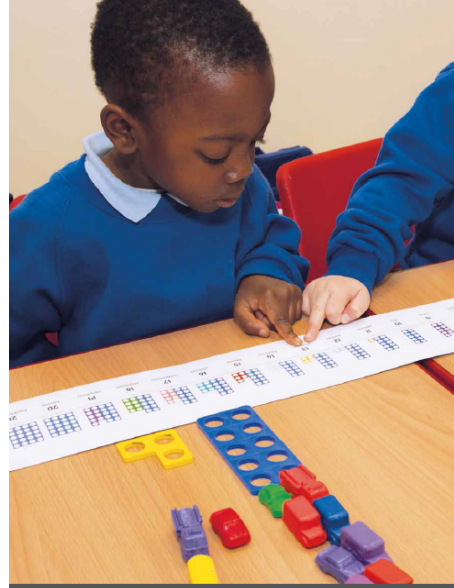
### Key features:

- balance between **adult-led** and **child-initiated** learning
- variety of different **learning areas** (sand, water, construction, small world...)
- particular emphasis on learning outside
- making use of stories, themes and opportunities from other parts of the curriculum in maths learning



## What's in the new folder?

1. Teaching Guide
2. Planning
3. Activity Groups
4. Photocopy Masters



# 1. Teaching Guide

- Current best practice
- Putting the Numicon approach into practice – how? (planning, assessment, environment)
- Key Mathematical Ideas – deep subject knowledge



approximately two weeks. Given their different ages, developmental stages, interests and experience when they start school, children won't all progress at the same time or pace, so it is not expected that every child will do every activity. Allow those who need and want to continue with earlier activities – particularly activities with Numicon structured apparatus – to do so, and likewise encourage others to move on to increased challenge steps and activities when appropriate.

Plan to cover the activities from the All doing maths together section of each activity group over the two weeks. These are designed for use with the whole class or groups, led by the teacher (or another trained adult). In this section of the activity group, you will also be drawing on ideas from the Daily counting activities and Daily maths opportunities activity groups. You will probably find that you get into a daily routine of using maths opportunities at register time, and incorporating counting activities into transition times, when children are standing in line, moving around the school, choosing activities, and so on. Not all children may fully understand these activities but it is important that they are included and hear the related language being used, so that over time they are able to join in.

In each activity group there are activities with structured apparatus, including Numicon Shapes and number rods. These activities can be demonstrated (modelled) by adults as they sit and play alongside individual children or with small groups. Sometimes games and activities can be modelled to the class, for example, at registration time children will see how Numicon Shape patterns are built

as they help to group their names to show how many children are present. Playing dice games with the whole class provides a model for ways in which children can play the game independently. Modelling like this allows children to learn in the way that they learn naturally, by observing and listening, beginning to join in alongside adults and eventually, when they understand, to do activities independently.

Both number rods and Numicon Shapes play an important role in providing children with imagery for number ideas and relationships between numbers. As you follow the activity groups, you will find that number rod activities tend to follow a step behind those involving Numicon Shapes, because children tend to make connections between Numicon Shapes and number ideas before they connect number rods and number ideas. They can count the holes in Numicon Shapes and notice regularly increasing patterns, which provide them with an initial picture of both the ordinal and cardinal values of numbers. However, it is when children refer to rods by number name that they are well on the way to generalizing number ideas and are using their understanding about relationships between numbers. Number rods also provide a useful connection between number and length. The use of number rods increases steadily throughout the Numicon teaching programme.

## Encouraging children's mathematical communicating

The teacher and other adults in school have crucial roles to play as model communicators for children. It is important



## 2. Planning

- Long term planning

### Long-term planning

The long-term planning chart provides the recommended order for the activity groups. Activity Groups A and B (Daily maths opportunities and Daily counting activities) are a flexible planning tool. They contain ideas for incorporating meaningful mathematics into everyday practice.

Activity Group Number	Activity Group Title	Space, Shape and Measures Focus
A	Daily maths opportunities	No single focus
B	Daily counting activities	No single focus
1	Introducing Numicon Shapes	Size
2	Introducing number rods and ordering Numicon Shapes	Height and length
3	Introducing Numicon Shape patterns and number rod trays	2D and 3D shapes
4	Linking Numicon Shapes with numbers and numerals, and comparing number rods	Capacity
5	Securing links between numerals, Numicon Shapes and patterns, and ordering number rods	2D and 3D shapes
6	Finding how many by grouping, and teen numbers	Length
7	Using Numicon Shape patterns and teen numbers	Lengths of number rods, weight
8	Adding with Numicon Shapes	Time (night and day)
9	Adding one more	Money
10	Taking away with Numicon Shapes	2D and 3D shapes
11	Subtracting one and adding one with number rods	Opposites
12	Halving and sharing	2D and 3D shapes
13	Adding – parts and wholes	Weight
14	Subtracting – parts and wholes	Positional language
15	Connecting adding, subtracting and number lines	Length and distance
16	Halving and doubling	2D and 3D shapes
17	Subtracting – finding the difference	Capacity, height
18	How many more, how many fewer, how much less?	Money
19	Exploring adding and subtracting, and sequences	Height, length, time

## 2. Planning

- Medium term planning
- Guide to Activity Group

### Medium-term planning

The medium-term planning chart provides the recommended order for the activity groups, along with Activity Groups A and B which are designed to be used every day. Learning opportunities and the activities with structured apparatus have been listed, but each activity group also includes a range of creative ideas for exploring maths in every environment across the setting. The shape, space and measures focus has been provided for each activity group using the abbreviation 'SSM focus'.

#### Activity Group

##### A: Daily maths opportunities

###### Activities with structured apparatus

Ideas for using structured apparatus are incorporated throughout this activity group.

###### Learning opportunities

A broad range of learning opportunities to demonstrate the relevance of maths to other aspects of school life and develop fluency in counting and calculating.

##### B: Daily counting activities

###### Activities with structured apparatus

Ideas for using structured apparatus are incorporated throughout this activity group.

###### Learning opportunities

Within their counting range:

- Recite the conventional count sequence forwards and back, starting from any number.
- For a given number, say the next or previous number.
- Understand that we count to find out 'how many'.
- Count a collection of objects accurately, saying one number name for each object.
- Understand that the last number counted tells us how many there are.
- Relate counting forwards and back to a number line.
- Have a sense of where to find a given number on a number line.
- Develop a strategy for counting accurately.
- Make a reasonable estimate of the number of objects in a collection.
- Count in twos, fives and tens.

##### 1: Introducing Numicon Shapes

SSM focus: Size

###### Activities with structured apparatus

- 1: Introducing the Numicon Shapes
- 2: Naming the Numicon Shapes by colour
- 3: Matching Numicon Shapes to the Numicon Number Line
- 4: Cover the Numicon Baseboard with Numicon Shapes
- 5: Cover the Numicon Baseboard – feeling for Shapes
- 6: Cover the Numicon Baseboard – using fewer Shapes
- 7: Playing with Numicon Shapes and Picture Overlays

###### Learning opportunities

- To recite the count sequence in the conventional order.
- To count objects using one number name for each object counted.
- To become familiar with the Numicon Shapes and their colour names.
- To notice the order of Numicon Shapes.
- To cover the Numicon Baseboard with Numicon Shapes by matching and manipulating them to fill the available spaces.
- To use the language of size and make simple size comparisons, e.g. big and small.

### 3. Activity Groups

- **21 Activity Groups** – 4 pages each
- The first 2, A and B are **COUNTING** for use throughout the year or years if used from age 3





### 3. Activity Groups

- Opening page - educational context, words and terms, Learning Opportunities, Assessment Opportunities, Key Mathematical Ideas
- Whole class / Structured / Explorative activities
- Stories, songs and rhymes
- Cross-curricular links



### 3. Activity Groups

- Progression of **21 Activity Groups**
- One to two weeks of activities each
- Counting activities run alongside these
- Total of 38 weeks, equivalent to NPC and GMS in Numicon 1-6

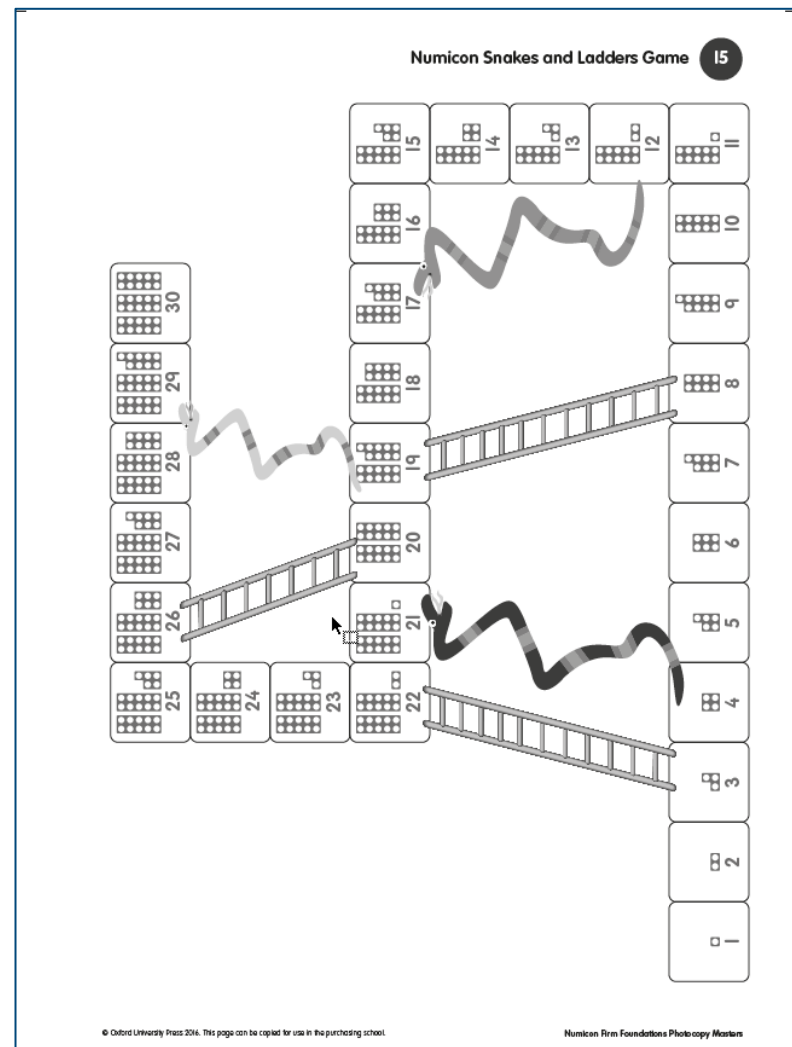


## Photocopy masters

- 15 black/white Photocopy Masters
- Editable versions and lots of extra printable resources online...

## Also on *Numicon Online*...

- Planning and assessment support
- Videos for getting started
- Curriculum matching
- 'Counting and number ideas book' for capturing evidence



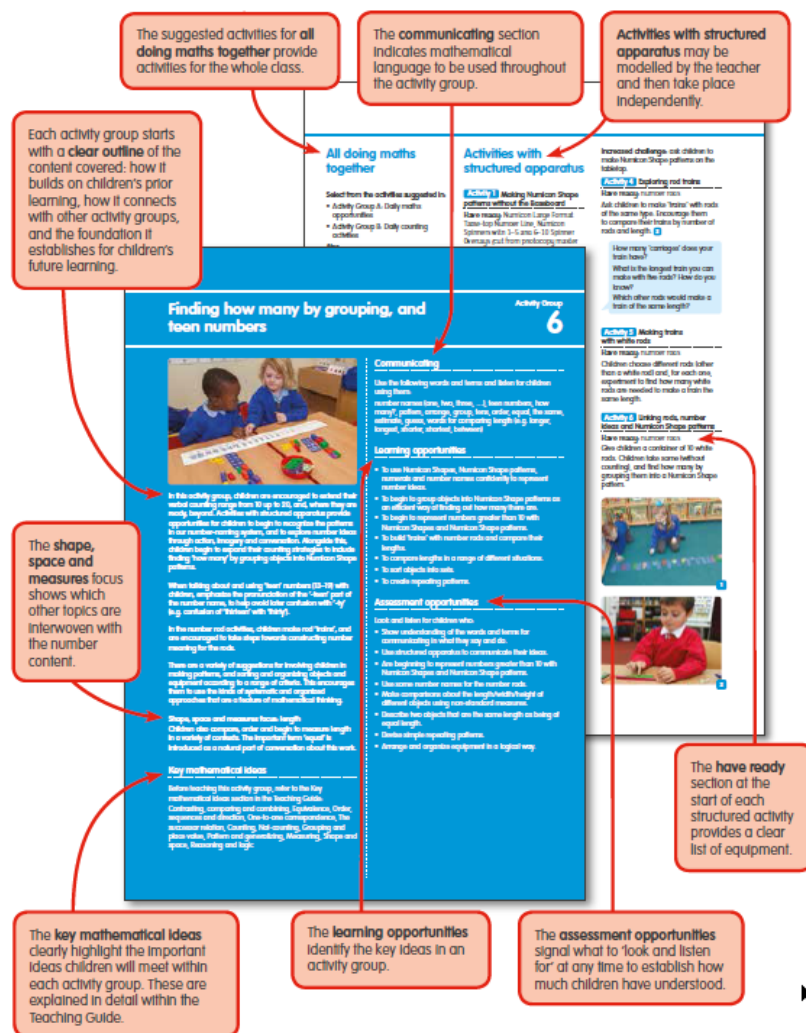


## Clear guidance:

- Detailed progression
- Challenge, variation and extension
- Geometry and Measurement
- Indoor and outdoor activities
- Photos show the learning at a glance

## Using the activity groups

Activity Groups 1–19 follow the structure detailed below. Activity Groups A and B are structured differently so they can be used throughout the school year and provide suggestions for introducing maths into all the elements of the school day.



The diagram illustrates the layout of an activity group page, with callouts explaining its components:

- The suggested activities for all doing maths together provide activities for the whole class.** (Points to the 'All doing maths together' section)
- The communicating section indicates mathematical language to be used throughout the activity group.** (Points to the 'Communicating' section)
- Activities with structured apparatus may be modelled by the teacher and then take place independently.** (Points to the 'Activities with structured apparatus' section)
- Each activity group starts with a clear outline of the content covered: how it builds on children's prior learning, how it connects with other activity groups, and the foundation it establishes for children's future learning.** (Points to the 'Finding how many by grouping, and teen numbers' section)
- The shape, space and measures focus shows which other topics are interwoven with the number content.** (Points to the 'Shape, space and measures focus' section)
- The key mathematical ideas clearly highlight the important ideas children will meet within each activity group. These are explained in detail within the Teaching Guide.** (Points to the 'Key mathematical ideas' section)
- The learning opportunities identify the key ideas in an activity group.** (Points to the 'Learning opportunities' section)
- The assessment opportunities signal what to 'look and listen for' at any time to establish how much children have understood.** (Points to the 'Assessment opportunities' section)
- The have ready section at the start of each structured activity provides a clear list of equipment.** (Points to the 'Have ready' section)

**Activity Group 6: Finding how many by grouping, and teen numbers**

**Communicating**

Use the following words and terms and listen for children using them:

number names (one, two, three...), teen numbers, base ten, partition, separate, group, less, more, equal, the same, different, longer, shorter, bigger, smaller, length, to go, larger, longer, shorter, longer, shorter.

**Learning opportunities**

- To use Numicon shapes, Numicon Shape patterns, Numicon Shape patterns and Numicon Shape patterns to represent number ideas.
- To begin to group objects into Numicon Shape patterns as an efficient way of finding out how many there are.
- To begin to represent numbers greater than 10 with Numicon Shapes and Numicon Shape patterns.
- To build 'trains' with number rods and compare their lengths.
- To compare lengths to a range of different situations.
- To sort objects into sets.
- To create repeating patterns.

**Assessment opportunities**

Look and listen for children who:

- Show understanding of the words and terms for representing what they say and do.
- Use Numicon shapes to communicate their ideas.
- Are beginning to represent numbers greater than 10 with Numicon Shapes and Numicon Shape patterns.
- Use number names for the number rods.
- Make comparisons about the length/width/height of different objects using non-standard measures.
- Describe how objects fit on the same length as being of equal length.
- Describe repeating patterns.
- Arrange and organise equipment in a logical way.

## Clear guidance:

- Doing Maths together – whole class and groups
- Structured activities now including Cuisenaire
- Exploring...creative ideas for water, sand etc
- Stories, songs and rhymes
- Speech bubbles modelling language
- Curriculum links

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Numicon Firm Foundations – Using the activity groups

The different sections provided in exploring maths all around us offer suggestions on how the activities can be reinforced and extended to all areas of the setting, indoors and outdoors.

There are regular opportunities for increased challenge, variation and extension throughout the activity groups.

Speech bubbles model potential conversation across all the different areas of the setting.

Activity Group 6

### Exploring maths all around us

**Outdoor maths and physical play**

- Ask children to run, skip or hop, then, when you give a signal and hold up a large Numicon shape. Stop, stop and arrange themselves into groups with the number of children matching the shape. Begin with, e.g. the 3- and 5-shapes, and move on to larger numbers over time.
- Increased challenge: children arrange themselves into the Numicon shape pattern for the number.
- Provide children and spaces of different colours, lengths and patterns for children to play with creatively.
- Model and invite children to 'draw' 3D shapes in the air with dance clothes.

Can you make big circles?  
Can you make straight lines?  
What shapes can you make?

Encourage children to talk about the different patterns, lengths and widths of the ribbons and scarves. They can select several and order them according to longest or shortest to shortest.

• Play 'make a hole and walk': hide soft toy animals or favourite outdoor toys. Encourage children to find and then order by length.

Encourage children to describe when they find the animals using positional language, e.g. behind, in front of, above, below, on top, under, inside, and to talk about length when ordering the animals.

• Set out objects, e.g. cones, shapes, bags, in repeating patterns of, e.g. type, colour, encourage children to describe and continue, and create their own.

Variation: ask children to sort objects into sets by, e.g. colour, shape.

### Sand, water and messy play

Many collections of small objects of different types, e.g. plastic lids, shells, pebbles, in wet sand for children to find and sort. Then find how many in each set by grouping them into Numicon shape patterns.

Encourage them to think about different colours for sorting, e.g. type, size, colour.

Push stones of different colours and lengths into wet sand so that the length left above the sand is the same. Ask children to put out two stones and say how they compare, e.g. 'The yellow stone is longer than the pink one'.

Increased challenge: children pull out a third stone and compare it to the first two, or put out three or more at a time.

Invite children to make moulding dough snakes, and compare and order them by length.

Can you make two snakes of the same length?  
Can you make two snakes of different lengths?

Children may also like to describe their snakes with repeating patterns by sorting them with different materials or making impressions with different objects, e.g. pine balls, paper clips.

Make Numicon number ten hand bands: children cut out Printable Numicon shape bands on the Oxford Owl website and stick them on a strip of paper or card to show a number ten. Then join the ends to make a hand band to wear and keep.

### Expressive arts and design

Set up an area with, e.g. a piece of garden tubing or a hula hoop into which children can weave different-length strips of interesting materials, e.g. fabric, ribbon, plastic from plastic bags, felt strips.

Encourage children to talk about what they are doing and how the design is developing, describing and comparing lengths, shapes and materials.

### Role play, small world and construction

Work with children to draw maps of uniting and arranging equipment when it is set out at the start of the day or session. Encourage them to know if it is the same way of the end.

Provide several drawing up items of the same type, e.g. cones, scarves, shirts, shorts, in different lengths or sizes, for children to use and discuss. As children explore how the clothes fit, they will be discussing size and length.

### Why did you choose that colour?

What shapes can you make?  
Could we make them again, but make it bigger than first? How?

Provide outlines of shapes of different lengths for children to describe the repeating patterns. They could make patterns of, e.g. the same line, long and short, different 3D shapes, different colours. Cut out and sort the patterns for children to use in 'make a hole and walk' (see Outdoor maths and physical play).

### Stories, songs and rhymes

Show and talk about stories that refer to length.

Bring songs involving different lengths or add new verses to songs. Discuss these with children, encouraging them to describe and compare them, e.g. how a song is getting longer and longer.

Include new number rhymes with children, including numbers beyond 10.

### Other curriculum links

**Understanding the world – People and communities**

- Joining being of the world's surgery.

**Understanding the world – The world**

- Thinking about animals at the vet.

**Understanding the world – Technology**

- Sorting and ordering objects, including natural objects.
- Grouping on-screen pictures into Numicon shape patterns.

Learning is consolidated through stories, songs and rhymes and links to other curriculum areas.

Photos illustrate the activities and indicate the learning at a glance.



**Numicon is a multi-sensory approach to understanding mathematics, built on a proven pedagogy that raises achievement across all ability levels.**

Here, you will find *Numicon* planning, assessment and curriculum support for Number, Pattern and Calculating 1–6 and Geometry, Measurement and Statistics 1–6.

**NEW:** tracking spreadsheets to support the Numicon KS1 & KS2 National Curriculum Test Practice Questions.







**NEW:** planning and assessment support for Number, Pattern and Calculating 6 and Geometry, Measurement and Statistics 6.



# Opening page: Index of resources Filter box for searching

Select a filter and press **Filter results** each time.

Showing 1-20 of 2059 resources


Name and description 	Stage 	Key area 	Resource type 	Resource file
<b>Numicon Index</b> Index of what's included in Numicon Online	Numicon 1, Numicon 2, Numicon 3, Numicon 4, Numicon 5, Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>KS1 National Curriculum Test Practice</b> Questions, Tracking Spreadsheet	Numicon 2	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	



# Select Stage: Choose Firm Foundations

Select a filter and press **Filter results** each time.

Showing 1-6 of 6 resources

Name and description	Stage	Key area	Resource type	Resource file
<b>Numicon 1 Milestone Tracking</b> Pupil progress chart	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 2 Milestone Tracking</b> Pupil progress chart	Numicon 2	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 3 Milestone Tracking</b> Pupil progress chart	Numicon 3	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 4 Milestone Tracking</b> Pupil progress chart	Numicon 4	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 5 Milestone Tracking</b> Pupil progress chart	Numicon 5	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 6 Milestone Tracking</b> Pupil progress chart	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>








# Select Stage: Choose Firm Foundations

Select a filter and press **Filter results** each time.

Numicon 1 (314)  
Choose Stage  
**Numicon 1 (314)**  
Numicon 2 (7)  
Numicon 3 (5)  
Numicon 4 (5)  
Numicon 5 (2)  
Numicon 6 (2)

Choose Key area

Choose Resource type

Name and description	Stage	Key area	Resource type	Resource file
<b>Numicon Index</b> Index of what's included in Numicon Online	Numicon 1, Numicon 2, Numicon 3, Numicon 4, Numicon 5, Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>Numicon 1 Milestone Tracking</b> Pupil progress chart	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 1 teaching progression</b> Chart showing the suggested order for all activity groups across Number, Pattern and Calculating 1 and Geometry, Measurement and Statistics 1	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>Numicon 1 teaching progression</b> Editable chart showing the suggested order for all activity groups across Number, Pattern and Calculating 1 and Geometry, Measurement and Statistics 1	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>What's included in Number, Pattern and Calculating 1?</b> What teaching material supports Number, Pattern and Calculating 1 with Derry Richardson (6 min 6 sec)	Numicon 1	Number, Pattern and Calculating	Teacher support video	 <a href="#">Play</a>
<b>What apparatus supports Number, Pattern and Calculating 1?</b> An introduction to the Numicon apparatus children will be using in class with Derry Richardson (9 min 17 sec)	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Teacher support video	 <a href="#">Play</a>
<b>What teachers say about Number, Pattern</b>	Numicon 1	Number, Pattern and	Teacher	

# Key areas

Select a filter and press **Filter results** each time.

Numicon 6 (183)








Number, Pattern and Calcul...

Choose Resource type

Number, Pattern and Calculating (183)

Geometry, Measurement and Statistics (17)

Showing 1-20 of 183 resources







Name and description	Stage	Key area	Resource type	Resource file
<b>Numicon Index</b> Index of what's included in Numicon Online	Numicon 1, Numicon 2, Numicon 3, Numicon 4, Numicon 5, Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>KS2 National Curriculum Test Practice Questions - Tracking Spreadsheet</b> Tracking spreadsheet for all arithmetic and reasoning worksheets in Numicon KS2 National Curriculum Test Practice Questions	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Teaching Year 6 with Numicon from September 2015</b> Guidance on teaching the Year 6 Programme of Study using Numicon from September 2015	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Curriculum coverage, Planning	 <a href="#">Download</a>
<b>Using Numicon 5 for Year 6 topics (editable)</b> Editable version of the breakdown of Year 6 content with links to Numicon 5 Activity Groups and suggestions for developing the activities further	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Curriculum coverage, Planning	 <a href="#">Download</a>
<b>Numicon 6 Milestone Tracking</b> Pupil progress chart	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Numicon 6 teaching progression</b> Chart showing the suggested order for all activity groups across Number, Pattern and Calculating 6 and Geometry, Measurement and Statistics 6	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>Numicon 6 teaching progression</b> Editable chart showing the suggested order for all activity groups	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>

# Classroom Resources

# Planning Resources

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Name and description	Stage	Key area	Resource type	Resource file
<b>Numicon Index</b> Index of what's included in Numicon Online	Numicon	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Planning	 <a href="#">Download</a>
<b>KS1 National Curriculum Test Practice Questions - Tracking Spreadsheet</b> Tracking spreadsheet for all worksheets in Numicon KS1 National Curriculum Test Practice Questions	Numicon 2	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>KS2 National Curriculum Test Practice Questions - Tracking Spreadsheet</b> Tracking spreadsheet for all arithmetic and reasoning worksheets in Numicon KS2 National Curriculum Test Practice Questions	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>
<b>Teaching Year 6 with Numicon from September 2015</b> Guidance on teaching the Year 6 Programme of Study using Numicon from September 2015	Numicon 6	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Curriculum coverage, Planning	 <a href="#">Download</a>
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<b>Numicon 1 Milestone Tracking</b> Pupil progress chart	Numicon 1	Number, Pattern and Calculating, Geometry, Measurement and Statistics	Assessment	 <a href="#">Download</a>

- Choose Resource type
- Choose Resource type
- CLASSROOM RESOURCES** ^
- Activity group summaries (255)
  - Classroom display (2)
  - Maths story starter (10)
  - Photocopy master (1060)
- PLANNING RESOURCES** ^
- Assessment (333)
  - Curriculum coverage (116)
  - Planning (224)
  - Professional development (3)
  - Teacher support video (61)



## **Options for use:**

- A three year programme for children aged 3 – 5 making a seamless transition to school. The second year children are at school, they begin Numicon 1, which begins with Securing Foundations as the review and extension
- A year long programme for New Entrants
- A 'dip in and out' book for New Entrants and Year 1 as a Learning Through play resource