

Key mathematical ideas Pattern, Ordering, Mathematical thinking and reasoning

1 Getting to know the Numicon Shapes, Numicon Shape patterns and ordering

Teaching notes

Some children may already be using number names for the Numicon Shapes; others may start to use them. If children are new to Numicon they may use colour names to start with. When you notice that they begin to use number names spontaneously it suggests that they are assigning meaning to the Shapes.



Homework activities accompany this activity group.

Activity 3: Homework activity 1.3 Making Numicon patterns without counting

Activity 4: Homework activity 1.2 Putting the Numicon Shapes in order

Activity 7: Homework activity 1.1 Find the matching Numicon Shape

Activities

Stage 1

Activity 1: Cover the board

Learning aims

- To become familiar with the Numicon Shapes.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

turn, flip, upside down, sideways, next, before, after, in between, ordinal number words (e.g. first, second, third), words for comparing, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue, biggest, smallest, bigger than, smaller than, more holes than, fewer holes than, 'sticking up' bit, straight edge

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the Shapes. Listen for children using number names.

Have ready: Numicon Shapes, Numicon Baseboard, a basket of mixed Shapes (including plenty of 1- and 2-shapes)

Step 1

Set the scene by explaining that this is a puzzle where the Shapes fit together. Talk about other puzzles where pieces fit together. Put out a Baseboard and ask children to cover the Baseboard using the Shapes from the basket (see [Fig. 1](#)).

Step 2

When children can do this confidently, increase the challenge by limiting the range of Shapes used (particularly the 1- and 2-shapes).

Further practice activities

Have ready: Numicon Shapes 1–10 in a Numicon Feely Bag, Numicon Baseboard

- Children take Shapes one by one from the Feely Bag to cover the Baseboard. As they start to fill the Baseboard, children will need to feel for the correct Shape to fit the gaps that are left.

Activity 2: Copying Numicon Shape patterns

Learning aims

- To build and match Numicon Shapes to their patterns.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

turn, flip, words for comparing, pattern, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the shapes. Listen for children using number names.

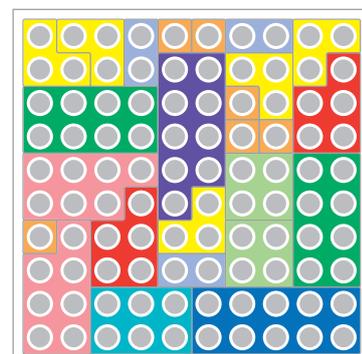
Have ready: Numicon Baseboard, Numicon Coloured Pegs

Step 1

Make a Numicon Shape pattern with Pegs on the Baseboard (start with a number lower than six) and ask children to copy it. Repeat, making other patterns for other Shapes.

Step 2

Practise often in following teaching sessions until children can copy the patterns of all the Shapes.



Activity 3: Putting Numicon Shapes in order of size

Learning aims

- To become familiar with the Numicon Shapes.
- To put Numicon Shapes in order of size.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

next, before, after, in between, ordinal number words (e.g. first, second, third), smallest, biggest, bigger than, smaller than, more holes, fewer holes, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

- Task 5

Have ready: Numicon Large Format Table-top Number Line, a set of Numicon Shapes 1–10 for each pair of children, items to order by size, e.g. Russian dolls, different sizes of spoons, strips of paper cut to different lengths

Step 1

Set the scene by asking children to put different-sized objects (e.g. Russian dolls, different sizes of spoons, strips of paper cut into different lengths) in order of size.

Step 2

Give pairs of children their set of Shapes in a jumbled pile. Explain that they are going to put them in order of size. Ask them to find the smallest Shape.

Step 3

Now ask children to find the next-biggest Shape. Continue until they have ordered all the Shapes, e.g. [Fig. 2](#).

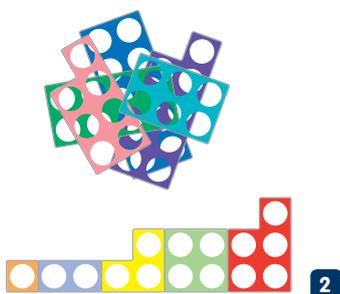
Step 4

If children are having difficulties, support them by referring to the Large Format Table-top Number Line. Practise often in following teaching sessions until children can confidently put a set of Shapes in order independently.

Further practice activities

Have ready: Numicon Shapes 1–10

- Show children a Shape. Ask them to find the next biggest Shape. Ask children ‘What comes next?’ Repeat with different Shapes.
- Show children a Shape. Ask them to find the Shape that comes before it. Repeat with different Shapes.



Activity 4: Playing ‘swaps’ and ‘fill the gap’

Learning aims

- To become familiar with the Numicon Shapes.
- To put Numicon Shapes in order of size.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

next, before, after, in between, next to, ordinal number words (e.g. first, second, third), bigger than, smaller than, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

- Task 5

Have ready: Numicon Shapes 1–10

Step 1

Children arrange a set of Shapes 1–10 in order and then close their eyes. While their eyes are shut, swap the positions of two of the Shapes.

Step 2

Ask children look carefully, point to the Shapes that have been swapped and explain what has happened. Children then move the Shapes back to their correct positions (see [Figs 3 & 4](#)).

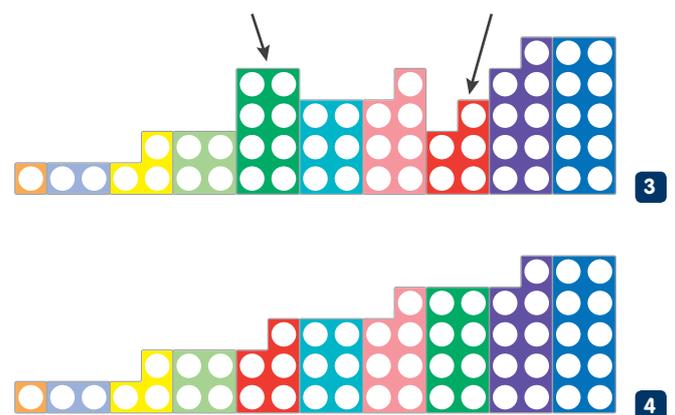
Step 3

Repeat often, making the game more challenging by swapping Shapes that are closer together in the ordered row. Children can play this game in pairs.

Further practice activities

Have ready: Numicon Shapes 1–10

- Play the ‘fill the gap’ game. Arrange the Shapes in order. Child 1 closes their eyes. Child 2 removes and hides one of the Shapes and then closes up the line of Shapes. Child 1 opens their eyes, looks carefully and says which Shape is missing. Child 2 reveals the Shape and Child 1 returns it to its position.



Activity 5: Using the Numicon Feely Bag to find the matching Numicon Shape

Learning aims

- To become familiar with the Numicon Shapes.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

next, before, after, in between, ordinal number words (e.g. first, second, third), words for comparing, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Discuss the size of the Shapes while playing the games.

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the shapes. Listen for children using number names.

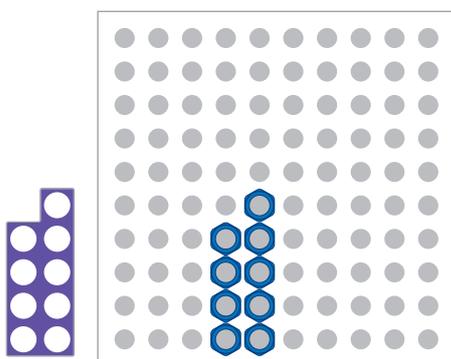
Have ready: Numicon Shapes 1–10 in order, three Numicon Shapes hidden in a Numicon Feely Bag (initially use three Shapes that are easily distinguishable, e.g. a 2-shape, 6-shape and 9-shape)

Step 1

Point to one of the Shapes in the ordered row that is also in the Feely Bag. The child feels in the Feely Bag to find the Shape. The child removes the Shape to check and then returns it to the Feely Bag.

Step 2

Repeat for each of the other two Shapes in the Feely Bag. Extend by choosing Shapes that are closer in size and extend further by putting more Shapes in the Feely Bag.



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Activity 6: Matching Numicon Shapes to Numicon Coloured Peg patterns

Learning aims

- To become familiar with the Numicon Shapes.
- To build and match Numicon Shapes to their patterns.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

next, before, after, in between, pattern, the same as, ordinal number words (e.g. first, second, third), bigger than, smaller than, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the Shapes. Listen for children using number names.

Have ready: Numicon Shapes 1–10 in order, Numicon Baseboard, Numicon Coloured Pegs

Step 1

Set the scene using the Pegs to make one of the Numicon Shape patterns on the Baseboard. Ask children to find the corresponding Shape and check by placing the Shape on top of the Peg pattern (see [Figs 5 & 6](#)).

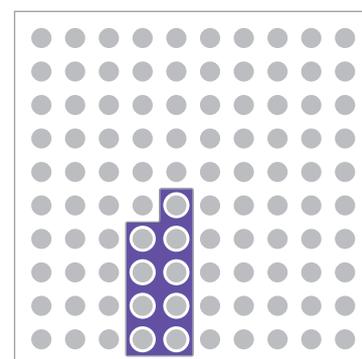
Step 2

Repeat for each Shape (not in order) and practise often in following teaching sessions until children can match each of the Shapes quickly and confidently to the corresponding Peg pattern.

Further practice activities

Have ready: Numicon Shapes 1–10 in order, Numicon Baseboard, Numicon Coloured Pegs

- Child 1 uses the Pegs to make one of the Numicon Shape patterns. Child 2 finds the corresponding Shape and checks.



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Activity 7: Building Numicon Coloured Peg patterns

Learning aims

- To become familiar with the Numicon Shapes.
- To build and match Numicon Shapes to their patterns.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

next, before, after, in between, pattern, the same as, ordinal number words (e.g. first, second, third), bigger than, smaller than, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the shapes. Listen for children using number names.

Have ready: Numicon Shapes 1–10 in order, Numicon Baseboard, Numicon Coloured Pegs, Numicon Large Format Table-top Number Line

Step 1

Choose a Shape. Ask children to look at it carefully for a few seconds and then arrange Pegs on the Baseboard into the pattern of the Shape (see [Fig. 5](#)). Children check by fitting the Shape over the Pegs (see [Fig. 6](#)) and find the matching Shape on the Large Format Table-top Number Line.

Step 2

Repeat with other Shapes.

Step 3

Practise often in following teaching sessions until children can arrange Pegs into the patterns of all the Numicon Shapes quickly and confidently. Challenge by showing children a Shape, then hiding it and asking if they can arrange Pegs into the Numicon Shape pattern from memory.

Further practice activities

Have ready: Numicon Shapes 1–10, Numicon Feely Bag, Numicon Baseboard, Numicon Coloured Pegs, Numicon Large Format Table-top Number Line for reference

Take account of children's confidence with building Numicon Shape patterns to decide whether to work from 0–5 or 6–10.

- Child 1 hides a Shape in the Feely Bag. Child 2 feels it and makes the pattern with Pegs on the Baseboard. Children remove the Shape and check by laying it on top of the Peg pattern. Allow children to adjust their Peg pattern if necessary so it corresponds with the Shape.

Have ready: Numicon Shapes 1–10, Numicon Feely Bag, Baseboard for Drawing Numicon Shapes and Numicon Shape Patterns (photocopy master 6)

- Child 1 hides a Shape in the Feely Bag for Child 2 to feel and draw the pattern on the Baseboard for Drawing Numicon Shapes and Numicon Shape Patterns (photocopy master 6). Child 1 could draw the Shape from memory.

Activity 8: Matching Numicon Shapes to Numicon Shape patterns

Learning aims

- To become familiar with the Numicon Shapes.
- To match Numicon Shapes to their patterns.
- To begin to see patterns in number relationships.

Words and terms for use in conversation

turn, flip, upside down, sideways, next, before, after, in between, bigger than, smaller than, biggest, smallest, colour names for Numicon Shapes: orange, pale blue, yellow, pale green, red, turquoise, pink, bright green, purple, blue

Record of Progress

Discuss the size of the Shapes while playing the games. Watch for how children manipulate the shapes. Listen for children using number names.

Have ready: Numicon Shapes, Numicon Spinners and Numicon Shape overlays cut from Spinner Overlays 1 (photocopy master 18), Numicon Feely Bag

Step 1

Children take turns to spin a pattern and find the matching Shape, e.g. [Fig. 7](#).

Step 2

Extend by using one of the Spinners and putting just those Shapes in the Feely Bag. Children spin a pattern and find the matching Shape from the Feely Bag.

Further practice activities

Have ready: Numicon Shapes, Numicon Coloured Pegs, Numicon Baseboard, Numicon Spinners and Numicon Shape overlays cut from Spinner Overlays 1 (photocopy master 18), Baseboard for Drawing Numicon Shapes and Numicon Shape Patterns (photocopy master 6)

- Child 1 spins a Numicon Shape pattern and finds the matching Shape. Child 2 makes the pattern using Pegs on the Baseboard. Then both children check that they have found and made the same pattern by placing the Shape on top of the Pegs. Allow children to adjust their Peg pattern if necessary so it corresponds with the Shape.
- Children spin a pattern and draw it on the Baseboard for Drawing Numicon Shapes and Numicon Shape Patterns (photocopy master 6).

