

Early Years Library

READ THE
INTRODUCTION
TO THIS SERIES

Part of the **Numeracy** Series

PATTERN AND SHAPE

What do we
mean by
pattern and
shape?

Children learn to recognise patterns and learn about the different physical properties of objects and shapes as they develop spatial awareness and begin to sort and categorise objects. As part of this, children learn about the different properties of different shapes, and become familiar with recognising and describing regular shapes (e.g., square, rectangle, oval etc) and the spaces between them using relational vocabulary (e.g., next to, on top, edge, corner, inside etc). Children also explore irregular shapes such as jigsaw puzzle pieces and building objects as they learn to understand what happens when shapes are combined, rotated, and taken apart. As part of pattern recognition, children learn to recognise similarities and differences, and the rules that underpin patterns and categorisation. Over time children can visualise what happens when shapes and patterns are changed, identify irregularities, and apply this learning to solving problems.

Why is it
important

Early spatial awareness and pattern recognition are important early skills for mathematical reasoning and logic. Supporting children's early spatial awareness development and pattern recognition can support children's achievement in maths as they mature.

Properties of shapes

Children become familiar with different properties of shapes (e.g., number of sides, corners, straight and curved edges). Children can explain why shapes are similar and different (e.g., triangle and square both have straight sides, but triangle has three sides, square has four sides). As part of their learning, children become increasingly confident describing and identifying 2D shapes and 3D shapes (e.g., triangle and pyramid, square and cube).

Most commonly used strategies in evidence-based manuals:

- Introduce shapes and their properties by using visual displays, materials and tools
- Talk about the properties of shapes using words like 'corners' and 'sides'
- Ask children questions about the properties of shapes and how they are similar and different

Inspiring Ideas

- Challenge children to make shapes with their bodies, or with help from a friend! Support children to discuss the properties of the shape they're making. *"Your mouth is making a very interesting oval shape! The edges are curved but it doesn't look like a circle- it looks more like an oval egg!" "I'm making a triangle with my two hands. Can we all count the sides?"*
- Shape hunt! Ask children to go on a hunt for a shape you really need, but you can't remember its name! *"I'm looking for a shape that's round all the way round!"*
- Feeling for shapes! Put a selection of 2D shapes into a feely box and challenge children to describe and name the shape they are feeling without looking. *"It has pointy corners? Hmmm, so it can't be a circle... how many corners does it have? 3! So, what shapes have more than 3 corners? So, it can't be a rectangle, square or diamond! I give up! What shape is it?"*
- Prepare for some interesting shape learning by supplying sticks and balls of play dough (or marshmallows!) for children to build their own 2D and 3D shapes. Allow them to discuss their creations, point out the shapes you notice, and support them with more complex shape names.

Spatial awareness

Children develop spatial reasoning by making designs with shapes and pattern blocks and solving shape puzzles and problems. Children learn to visualise what happens when shapes are combined, taken apart, and rotated and can describe shapes and blocks in their patterns and space (e.g., 'between', 'in front of', 'behind', 'next to', 'on top of', etc.).

Most commonly used strategies in evidence-based manuals:

- Make building blocks, shapes, and jigsaw puzzles available for children to play with freely
- Talk about shapes and their properties when making designs and solving shape puzzles and problems
- Challenge children to solve different shape puzzles and problems

Inspiring Ideas

- Using a selection of card or paper shapes, support children to build a picture using triangles, squares and circles. *"That is a brilliant person you've made! I like how you have used a circle for the head at the top, a rectangle for the body below the head, and triangles for buttons down the middle."*
- Building Challenge! Children can choose a picture of a famous building to try and recreate! Support children to choose their own resources and refer back to the picture as they go along. *"Ooh the Eiffel Tower! What a challenge to build! Let's look at the picture and see what shapes we need to find or make... so the bottom of the tower looks a bit like a triangle, and the top is a tower going straight up. Let's see what we can do!"*
- Shape Butterfly! On outlines of butterflies, have children stick small cut-out shapes on one wing to make a very beautiful pattern. *"Butterflies wings match, they are the same on both sides... can we copy the beautiful pattern we've made on this wing by putting the same shapes on the other side, too?"*

Tip

Give children plenty of opportunities to explore building with different shapes of blocks, encouraging them to incorporate other resources including other building materials and small world toys so they can experiment with how different shapes fit together.

Sorting and matching objects

Children are able to sort objects based on key characteristics such as size, shape, or number. As children develop their understanding of sorting and matching objects, they can be challenged to decide how to sort objects that have some key attributes in common (for example, sorting a group of different shapes by size not shape) and can sort a group of objects differently by using different rules.

Most commonly used strategies in evidence-based manuals:

- Provide a range of different natural and everyday objects and materials for children to sort which might include leaves, stones, jewels or buttons
- Talk about the different ways objects can be sorted based on their properties and ask children to sort objects in different ways

Inspiring Ideas

- Jam Jar Job! Invite children to help you organise your jam jars by finding the correct lid and matching it to the right size and shape jam jar. Talk to children about how we know when it matches and when it does not. *“This lid is too big for this jar! Is there a smaller one? That’s right, this one fits just right!”*
- We’re going to the zoo! Have children build a zoo using blocks to form different enclosures for different animals. Encourage children to sort the animals in a variety of different ways. *“Why did you choose to put these animals together? Some animals live in the water, some walk on land and some fly in the air. Do they need to be in the same place?”*
- What’s my rule? With a selection of shapes that can sorted in different ways (by shape, by colour and by size) make groups by colour and ask: *“What rule did I use to put all of these shapes in one pile? What do they have in common? Their colour, that’s right!”* Encourage children to sort the piles in different ways and tell you what their rule is.

Tip

When children are exploring their own ways to sort and categorise objects, support them in expressing the rule they have decided to follow. *“What do all the things in this pile have in common? Oh, you have decided to sort your piles by big, medium and small!”*

Identifying and repeating patterns

Children can recognise patterns that repeat (●●●● or ●●●●, for example) and identify the smallest repeating unit. Once children can identify the repeating unit, they can copy the pattern, and then extend it. Children notice that there is a difference between a repeating pattern, like stripes, and a non-repeating pattern, like a floral pattern on their t-shirt.

Most commonly used strategies in evidence-based manuals:

- Introduce different types of repeating patterns
- Ask children to copy and extend patterns and discuss what the smallest repeating unit is
- Provide a range of natural and everyday objects and materials, as well as blocks and shapes, for children to copy and extend their own patterns

Inspiring Ideas

- Clap, stamp or use musical instruments like drums, bells or cymbals to make repeating sound patterns. Begin by showing children the first part of the pattern and asking them to copy what you are doing, then ask them to repeat the pattern. *“Can you copy my sound pattern? [CLAP, CLAP, STAMP] That’s brilliant! Can we keep the pattern going? [CLAP, CLAP, STAMP//CLAP, CLAP, STAMP//CLAP, CLAP, STAMP] What a fantastic sound pattern you’re making!”*
- Using objects found outside, set up a repeating pattern (e.g. leaf, stone, leaf, stone) and ask the children to copy the pattern with their own materials. Support children to continue the pattern. *“I’m going to add a leaf to the end. What would come next?”*

Tip

Support children to notice patterns in their environment like the stripes on their top, or the pattern of paving stones.