Early Years Library

SERIES INTRODUCTION:
EARLY NUMERACY

Early numeracy skills lay a foundation for counting, understanding spatial relationships, and discovering patterns and connections in the world. Even young babies tune in to shapes, patterns and quantities, paying attention to sights and sounds around them.

Practitioners can support children's natural curiosity by showing interest in what children see and ask and posing questions so children can offer thoughts or solutions. Through these interactions, children will develop early numeracy skills in the context of meaningful everyday experience, and then be able to apply these skills to new problems and contexts.

Practitioners do not need to be experts in mathematics. Numeracy in the early years can be part of everyday activities rather than taught at a scheduled time. For example, opportunities for supporting early numeracy arise when talking to children about how to make pieces fit when building towers, or when measuring out flour to make dough. Everyday interactions involving patterns, numbers and measuring allow children to explore number, quantity, space, and shapes. Children benefit from having a positive attitude towards numeracy and mathematical problems. Early years practitioners can support children to develop confidence and enthusiasm when exploring new activities, encouraging them to have a go without being worried about making mistakes.

The Early Years Library contains four early numeracy booklets, each covering a core numeracy skill and key practices that can be used to support skill development. The table on the next page presents the four booklets.

PLAY IN EDUCATION DEVELOPMENT AND LEARNING
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If you want to support:	Focus on:
Pattern and shape	Properties of shapes
	Spatial awareness
	Sorting and matching objects
	Identifying and repeating patterns
Measurement	Becoming familiar with how to measure
	Becoming familiar with charts and graphs
Numbers and counting	Learning to count out loud
	Recognising numerals
	Learning the order of numbers
	Matching numbers to quantity
	Comparing and matching quantity
	Counting and set production
	Ordinal numbers
Adding and taking away	Plus or minus one from a number
	Adding two numbers together
	Subtracting numbers from each other

For more information on the Early Years Library and to download the booklets, visit www.EIF.org.uk/EarlyYearsLibrary

How can I use these booklets?

The booklets can be used very flexibly and for different purposes:

- During new staff induction, to help new staff understand why they focus on certain skills and activities.
- When planning activities for the children based on your understanding of their interests, needs and the curriculum in your setting. Practices and strategies can be adapted to your context, to children's age, and to your daily schedule.
- Throughout the day to get inspiring ideas for extending activities, responding to children and planning in the moment.

As a practitioner, you might find that you are already using many of these strategies and practices. This can give you the confidence that the work you are doing to support the children in your care is underpinned by evidence.

Commonly used strategies

Evidence-based programmes recommend a range of strategies for practitioners. Throughout the Early Years Library, you will notice that some of these strategies are used more frequently to support some skills, while other strategies are used more frequently to support other skills. For instance, physical actions and activities to separate one number from another, such as clapping and jumping, are frequently used to teach children to count out loud, while visual displays, objects and materials are frequently used to help children familiarise with properties of shapes. Using a range of strategies is most likely to support young children's development. At times, as a practitioner you will also step back and let children experience challenge and joy in their learning without getting involved.


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Strategies to support early numeracy skills include:

- Visual displays, objects and materials
- Discussion, questions and answers
- Didactic instruction and teacher modelling
- Drawing and writing
- Multimedia
- Strategy practice and physical learning
- Games, role-play and child modelling
- Timetabled routines
- Books, songs and nursery rhymes
- Art and creative projects

Inspiring ideas

To support each of the skills, the Early Years Library offers inspiring ideas based on typical activities in evidence-based programmes. There are a range of activities suitable for individual, small group, and whole group activities. Some of the inspiring ideas are appropriate for in-the-moment interactions with children, while others require more planning. They are meant to inspire your practice, not dictate it. You can use the inspiring ideas to reflect on your practice, discuss ideas with colleagues and plan how to respond to children's interests and needs in relation to your curriculum.

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Unique individuals

Research shows that each child develops in a unique way, rather than following a strictly linear pre-defined route through development in a specific order or timeframe. For this reason the Early Years Library is not presented in chronological order by age. Practitioners can use their professional judgement to gauge which skills a child may benefit from focusing on at different times.

Inter-connected areas of development

While the booklets are presented separately, research shows that all areas of development are inter-connected. Supporting children's early numeracy skills will call on language and early literacy skills; supporting children's language and early literacy skills will call on social and emotional skills; and so on. The Early Years Library is designed to be flexible, allowing you to combine practices from across the booklets and return to the booklets in different ways at different times.

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Role of the adult in supporting child development

Early childhood education can help children build strong foundation skills in numeracy. When children have plenty of opportunities to explore and practise using early numeracy skills, they can apply the skills they learn to new problems and activities in their everyday life.

Practitioners can support children to develop these skills in a range of ways, for example by providing opportunities for children to count in different contexts, modelling and encouraging use of measuring and counting language (e.g. 'how many children can wash their hands at this sink?'), or talking to children about the different ways they could solve puzzles with shapes. Striking a balance between child-led and adult-guided experiences helps children develop their love of learning while also supporting and extending their learning. The Early Years Library highlights specific effective practices from evidence-based programmes that you can weave into your existing approaches.

Are you using the Early Years Library?

We'd love to hear from you. Scan the code or visit bit.ly/contact-eyl

For more information, contact

- **www.educ.cam.ac.uk/centres/pedal**
- **www.eif.org.uk**

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.

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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.

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Part of the **Numeracy** Series

MEASUREMENT

What do we mean by measurement?

Children can engage with, and enjoy early experiences of measurement (such as playing with measuring tapes, balance scales, or lining up objects), graphs (such as voting on the book they will read first at story time) and corresponding language (such as 'heaviest', 'shorter' or 'more/less'). Young children are not expected to understand the more advanced principles underpinning these skills such as making sure all the units are the same size (standardised units of measurement), understanding why there are no gaps or overlaps between the units of measurement (i.e., placing units end to end), measuring in straight lines, and using the correct techniques in different measurement tools (e.g., when to use a measuring tape or a ruler). These more advanced skills will develop as they move through school.

Why is it important

By exploring measurements and graphs, children can see how maths can be used in everyday life to solve problems and represent information. Children can draw on these early experiences to support their understanding as they grow. These early skills help to support children's understanding of counting and quantities in order to make comparisons.

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Becoming familiar with how to measure

Children have the opportunity to experience measuring objects by their length, height, width, and weight using a variety of methods and units of measurement (for example using measuring tapes, string, or counting blocks). As children have more experience of measurement, they learn to describe properties using the measurement units (e.g., 'four blocks long') and use measuring words like 'smallest', 'largest', 'heavier', 'lighter', 'taller' and 'shorter' to make comparisons.

Most commonly used strategies in evidence-based manuals:

- Talk with children about the properties of objects using measurement vocabulary and ask them questions to compare different objects
- Provide opportunities for children to measure objects using a variety of non-standard measures, for example, linking cubes or crayons

Inspiring Ideas

- When children are making a tower out of stacking blocks, playing with toys of different sizes, or filling small and large containers during messy play, encourage them to line up the resources by size (perhaps by height, length, or how much they can hold). *"This dinosaur is definitely the biggest. Can you find a dinosaur that is shorter than this one?"*
- Height Hands! Ask children to measure their height by using their hands. *"Horses' heights are measured by using our hands! The tallest horse EVER was 21 hands tall! Shall we see how tall we are by using our hands?"*
- Using balance scales, support children to compare the weight of objects and guess which objects might be the heaviest. *"That side of the scale is almost touching the table and that side is up in the air! So, the leaves must be lighter than the pebbles! Can we find anything that might be heavier than the pebbles?"*
- When baking with children, use lots of measuring language alongside measuring spoons, jugs and weighing scales. *"Wow, the scales say this weighs 200 grams! How many more spoonfuls of flour do you think we'll need for the scales to say it weighs 300g? Look, the numbers are getting higher as we fill it up, that means it's getting heavier!"*
- Support children to pour from a large container into smaller container, beginning to introduce the concept of volume. *"Which jug holds the most? Now they're both full, which one feels the heaviest?"*

Tip

Have balance scales or kitchen scales, rulers and measuring tapes as part of your continuous provision both indoors and outdoors so children can explore the idea of measuring during free play.

Tip

Activities like a sand pit and baking give children practical experience of the language of measurement and using early measurement skills to solve problems and produce meaningful outcomes.

Becoming familiar with charts and graphs

Children become familiar with charts and graphs (for example, tally and bar charts) through meaningful experiences. The charts and graphs children create should have meaning and an outcome that children will see immediately in order to enhance their understanding and appreciation of what charts and graphs mean. For example, children will vote on what activity to participate in first that day, rather than voting on everyone's favourite activity. These early experiences of creating charts and graphs can be a valuable tool for capturing children's voice by showing them their views are valued and make a difference in their learning environment.

Most commonly used strategies in evidence-based manuals:

- Visually display charts and graphs. For example, you could build a graph using characters to show which is the most popular book to read at the next story time
- Talk to children about the charts and graphs you have created and use the words "more" and "less" to ask questions (e.g., *"Did we see more flies or ants in the garden?"*)

Inspiring Ideas

- Tallest Tower Bar chart! At story-time, have each child place one brick/block/cube next to the book they would like to hear first. Their votes will build towers next to the books. *"Which tower is the tallest? Yes! That means that most children want to read this book first! How many children wanted to read the other book first? Shall we count the blocks and see?"*
- Using a display, support children to record how they got to their setting each day for a week. This can be represented in different ways, for example, by using stickers or voting with toy cars, buses etc. *"We all get to nursery in different ways. How do most children get here? Walking, that's right."*

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NUMBERS AND COUNTING

What do we mean by numbers and counting?

Becoming familiar with numbers, numerals (written numbers) and learning to count are important skills for early numeracy. Children learn to count out loud in the correct order, recognise numerals and sequence numbers from 0 to 10. As they become more confident with numbers and counting, children learn that the numbers they say, and the numerals they know, represent quantity and they can compare sets that have 'more' and 'less'.

Why is it important

Young children will engage with numbers, numerals and number problems spontaneously and should be supported to explore and experiment with numbers and counting in their everyday environments and learning activities to develop a positive attitude to numeracy. Allowing children to explore and experiment with numbers, counting, and numerals in play allows them to practise and develop their early numeracy skills. Children can then apply these skills to new settings and new problems they come across with increasing confidence and familiarity.

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Learning to count out loud

Children learn to count out loud in order, repeating verbally a number list. It does not necessarily mean they understand that the words stand for a certain quantity.

Most commonly used strategies in evidence-based manuals:

- Demonstrate counting out loud for children and encourage them to join in on counting activities, asking them what numbers they think come next
- Have children do physical actions and activities to separate one number from another, e.g. clapping, stomping, jumping etc.
- Use a variety of props (such as counting wands or puppets) to engage children in activities and encourage them to say numbers out loud
- Use songs and videos to provide a scaffold for children to practise counting out loud

Inspiring Ideas

- Get children ready to race, tidy up or sing a song by counting up or down: *"We're going to go on 5-ready? 1…2…3…4…5… GO!"*
- Clap and Count! When singing a song which involves counting, encourage children to clap, stomp or jump once for each number they sing to help children separate one number from another.
- While counting aloud to ten, children start as curled up and small as possible, as they count they can slowly expand, stand up, and reach to the ceiling, ending up as tall as possible when they reach ten. They can then be supported to count backwards from ten, while slowly curling into a ball!

Tip

Providing opportunities for children to count backwards, for example in countdowns, can help them to practise counting in sequence. This can help to reinforce their learning and supports them to start counting from starting points other than one.

Recognising numerals

Children learn to recognise numerals (written numbers) and can name them. This does not necessarily mean they understand that the numerals stand for a certain quantity.

Most commonly used strategies in evidence-based manuals:

- Identify numerals for children throughout activities by pointing them out and naming them to help children become more familiar with numerals
- Ask children about what numerals they recognise and encourage them to describe what numerals look like (e.g., the number eight is two circles)
- Introduce numerals to children by using visual displays and tools such as print outs of numerals, foam number manipulatives, number lines and charts, or number dice

Inspiring Ideas

- Number Hunt: Hide various numerals around the classroom in lots of different forms (e.g. labels, number cards, foam numbers). Have children roam around the classroom and find as many target numbers as they can, bringing them back to show their peers.
- When children spot a numeral, challenge them to find the same numeral in their environment. *"You've spotted an 8! Can you find another 8? An 8 looks like two circles, one standing on top of the other!"*
- What's your numeral? Using a number line, support children to find their age from the numerals. *"So, you are four years old! Yes, that's a '4'! How old is your sister/ brother/ friend? Can you find their age?"* Encourage children to start at 1 and count up to their age by pointing to each numeral on the number line.

Tip

Support children to trace important numerals like their age, or numerals that they see in activities as a way of reinforcing their learning.

Tip

Point out numerals in children's environment: price tags in shops or role play, numbers on street signs and clocks, and labels on food containers.

Learning the order of numbers

Children learn the sequence of numerals and can count in order. Over time, children will know which numbers come directly before and after one another and can line up numerals in the correct sequence. Learning the order of numbers and being able to recite them in order does not necessarily mean children understand that these stand for a certain quantity.

Most commonly used strategies in evidence-based manuals:

- Demonstrate saying numbers out loud as numerals are placed in sequence to reinforce the order of numbers for children
- Use visual tools such as number cards, number manipulatives, number lines and number charts to help children visualise the sequence of numbers
- Talk to children about what numbers come before and after target numbers, and ask them to help you count along number lines and charts

Inspiring Ideas

- Support children to count along magnetic numbers from 1 to 5. *"What number comes next? 1…2…3…4…5….? 6! That's right! Can you find the 6 and add it to the other numbers?"*
- Detective game! Every night, one of the mischievous numbers from the number line goes missing! Can children be number detectives and figure out which number has disappeared? Support children to count along the number line and shout out the number that is missing.
- Practise 'counting on' with children by starting to count on a number line from numbers other than 1. *"Let's start at 3 today! We can miss out 1 and 2… so, 3…4…5"*

Matching numbers and numerals to quantity

Children develop an understanding that the numbers they say, and the numerals they know, represent quantity. Children learn to recognise the link between numbers and quantity by counting objects, counting things that can't be moved (e.g., dots on dice or dominoes), counting repetitions (five jumps, two steps forward), and representing numbers on their fingers. Children can then link these quantities to the appropriate numerals.

Most commonly used strategies in evidence-based manuals:

- Demonstrate counting objects out loud for children, discussing the activity and 'tagging' one object to one number as you go. Encourage children to copy and continue counting out quantities in the same way to help them practise
- Use visual tools such as number cards, number charts, numeral manipulatives, dice, and counting manipulatives (e.g., figurines, tokens, linking cubes, or beans) to help children match numerals to the correct number of items

Inspiring Ideas

- Jump and Count! Have children line up and get ready to jump! Hold up signs with different numerals on them. *"What number is this? A three, yes! Jump forward three times!"*
- After building a small world of animal homes, give each home a 'house number' by placing a numerals (1 to 5) next to each house. *"Can anyone tell what the number on the pigsty is? Number 3! Yes! Can we find 3 pigs to put into house number 3? So how many bears live in number 4?"*
- Number Bingo! Have children take turns to roll a dice. When they have counted the dots on the dice, they can put a counter on to their bingo card which has the numerals 1 to 6. First to fill up their card wins!

Tip

Using fingers to count is an easy way of helping children to link the numbers they know and say out loud to quantity.

Comparing and matching quantity

Children develop an understanding of numbers having higher and lower values, translating to more or less in terms of quantity. Children can count the number of objects in two sets and compare these to explain which group has more. Children link this knowledge to understanding that, for example, five is 'more than' three, both by knowing that the quantities they represent are different and by their number place value.

Most commonly used strategies in evidence-based manuals:

- Demonstrate to children how to count and compare different sets, and discuss your findings with children to make comparisons
- Ask children about the different numbers and quantities they see and count, reinforcing correct answers and counting through discussion
- Use visual tools such as number cards, number charts, number dice, and counting manipulatives (e.g., dominoes, tokens, blocks, or beans) to help children visualise number and quantity as they contrast and compare groups

Inspiring Ideas

- When playing a board game with a dice, prompt children to count the number of dots on the dice, then compare how many moves they are able to make to the other players. *"You rolled a 6, so you can move six spaces! I rolled a 2, you can move more spaces than me! 6 is more than 2! Oh look, we both rolled a three! That's the same number of spaces… those numbers are equal."*
- Share blocks out unevenly into three groups of 5, 6 and 7. Support children to count how many blocks are in each pile. *"We need to build the tallest tower, which group has more blocks? Yes, that group does look the biggest, let's build the towers and check! So, 7 is more than 6 and 5"*
- Using a number line, support children to add quantities of leaves, toys or counters that match the appropriate numerals. *"Which group has the most leaves? And which has the least? Here's 3 leaves, that's more leaves than 2! That's right! But 3 leaves is less than…?"*

Counting and set production

Children can count and produce sets. This includes counting out sets of objects, spaces (e.g. the spaces on a board game) and repetitions (e.g. five jumps or two steps forward). As children develop, they will eventually be able to count moving targets or things that they can't currently see a set of (for example, the number of cars that have driven past their window).

As children become more confident with counting, they will produce sets of larger numbers, be able to look at a small group of items and understand how many there are without having to count them all (also known as 'subitising') and develop their understanding of how numbers are added together or taken away from one another in different combinations to make the same total (known as 'number bonds').

Most commonly used strategies in evidence-based manuals:

- Use visual displays and tools such as number charts, number dice, and everyday objects in the classroom (e.g., toys, blocks, cups, pens etc) so children can practise producing sets of different numbers
- Invite children to count sets as they complete everyday activities in the classroom and beyond, demonstrating for support as necessary
- Talk to children about how they can use their counting skills to solve everyday problems and tasks (e.g., making sure everyone had a plate for snack, gathering enough teddies for their classmates, making sure they have enough pegs to hang out clothes, or making sure they have the right number of lids for their jars)

Inspiring Ideas

- During role play, ask the shopkeeper for different numbers of items from your shopping list. *"I would like 3 bananas and 2 tins of baked beans, please."*
- On a walk or drive, support children to count how many buses, signs or red cars they spot on their journey.
- Children take turns setting the table for snack time or for a teddy bear's picnic. Each person or teddy needs a plate, cup and spoon. *"How many teddies/ people are there? 7! How many plates do we need? Yes! Let's count out 7 plates, 7 cups and 7 spoons then set the table!"*

Ordinal numbers

Children develop an understanding of numbers as first, second, third, etc., in a sequence

Most commonly used strategies in evidence-based manuals:

- Talk to children about the order of things when you notice an opportunity during the day
- Label the different positions in sequences children see in everyday activities
- Use visual displays and tools such as number cards, number lines and charts, and toys to help children visualise the sequence of numbers and label the order they appear in

Inspiring Ideas

- When children are waiting patiently in a line to go inside point out where they are standing in the line! *"You are first in line, you are second in line, and you are third... Who is going to wash their hands first?"*
- Toy Race! Set up a race between 3 toy cars or balls on a slope. *"Let's guess which car will arrive first. Which one might come second? Shall we check and see? Let's race!"* After the races, children can put the cars behind signs that say '1st', '2nd' and '3rd'. *"This sign says 'first', we can put all our fastest cars here!"*
- Form a line using chairs or individual circle mats and ask children where they would like to sit on the bus. *"Teddy is driving us today, so they are in the first seat! Which seat would you like to be in? The fifth seat! Good choice!"*

Tip

Expose children to the language of 'first', 'second', and 'third' etc. during everyday routines and fun activities like role play so children can build their knowledge and experiences of ordinal numbers.

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ADDING AND TAKING AWAY

What do we mean by adding and taking away?

Adding is the process of working out the total of two or more numbers whereas taking away (or subtracting) is the process of taking one number away from another. At first, children will count objects in groups to figure out how many there are in total, and then again to figure out how many there are once objects have been added or taken away. As they progress, children will be able to find the answer without counting each object out individually. After developing their number and counting skills, children will build on these skills by adding and taking away numbers up to 10. Children begin to understand and remember how to add and take away through practical, meaningful experiences during day-to-day activities.

Why is it important

Being able to add and take away is foundational to many other mathematics skills and prepare children for learning about other topics, including multiplication and division, in school.

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Nuffield Foundation

Plus or minus one from a number

Children become familiar with adding or subtracting one from a small number of objects (0-10). As they develop their confidence with numbers, they may be able to name the final number without counting out the whole set (also called 'subitising').

Most commonly used strategies in evidence-based manuals:

- While describing adding and taking away one, demonstrate the action using small objects and finger counting to help children visualise the concept
- Talk to children about what they think will happen if they add or take away from the set they already have
- When practicing adding and taking away one from a set, use visual tools like small everyday objects (e.g. tokens, toys, and linking cubes) to help children visualise what happens

Inspiring Ideas

- Use your fingers when singing counting songs to show children what 'one more' and 'one less' looks like. *"Here are 3 little ducks about to go swimming! 'Mummy Duck says QUACK QUACK COME BACK! And two little ducks came swimming back!' One of my little ducks hasn't come swimming back!"*
- When children are choosing their own fruit at snack time, support children to count how many pieces of fruit or crackers they have on their plate, then count again after adding one more. *"How many pieces did you have at first? And how many do you have now I have given you one more piece?"*
- When playing 'Five Little Speckled Frogs' ask children: *"How many frogs are sitting on the speckled log? Now one of your frog friends has fallen into the pool! How many frogs are left? Let's count and see!"*

Adding two numbers together

Children become familiar with adding two small numbers (0-10) together. This builds on other numeracy skills, such as counting and set production and subitising. Children begin to add two numbers together by counting the number of objects in front of them one for one, and comparing how many objects they have before and after. Children then develop an understanding that numbers, when added together or taken away from one another in different ways, make the same total (also known as 'number-bonds').

Most commonly used strategies in evidence-based manuals:

- Describe and demonstrate to children what happens when two sets are combined, asking children to tell you what they think will happen throughout the activity
- Use visual tools like small everyday objects (e.g. blocks, counting bears, or seeds) to help children understand what happens when two sets are added together

Inspiring Ideas

- Help children to plant sunflowers in rows. *"We have planted three seeds in the first row, and three seeds in the second row… How many sunflowers have we planted altogether? How could we figure it out? We could wait and count the shoots, yes! Maybe we could count on our fingers, too? 3 seeds and 3 more seeds… that makes 6 seeds!"*
- Using two dice when playing a board game, support children to add the numbers together to see how many spaces they should move. At first, children will do this by counting the dots on the two dice. *"Can you count the dots altogether? 1…2… yes! Now on the next dice… 3…4…5! You can move 5 spaces! Brilliant!"* As they become more experienced, children will begin to remember number bonds. *"You rolled a two and a three again! Can you remember what two and three together make? Yes! 5!"*
- When building a tower with a friend, support each child to count how many blocks they have. *"You have four blocks and your friend has two blocks, how many blocks do you have altogether? Shall we build a team tower and see?"*

Tip

Children learn about addition through practical experiences where they can see (and count or subitise) objects in groups in front of them.

Taking away numbers from each other numbers from each other

Children become familiar with taking away (or subtracting) one small number from another (0-10).

Most commonly used strategies in evidence-based manuals:

- Describe and demonstrate to children what happens when units are taken away from sets, asking them to tell you what they think will happen throughout the activity
- Visual tools like small everyday objects (e.g. blocks, counting bears, or seeds) can be used to help children understand what happens when units are taken away from a set

Inspiring Ideas

- When building a tower, support children to count how many blocks they have used. *"If two blocks fell off your tower, how many do you think would you have left? Shall we take two blocks off and check?"*
- At story time, support children to use their fingers to count through objects or events in the story. For example, show how many pieces of fruit a character has when they set off on their journey and how that might have changed by the end. *"Oh no! Now the monkey has taken a piece of fruit AND the ostrich has taken a piece of fruit AND the zebra has taken a piece of fruit, too! Three pieces of fruit... gone! Can we put three fingers down? How many pieces of fruit do they have left?"*
- The Pirate toys must guard their treasure of four large gold coins overnight. In the morning, some coins are missing! *"Oh no! How many coins were there yesterday? 4! And how many are there today? Only 2?! How many do you think we need to look for? So, 4 coins takeaway 2 coins leaves us with 2 coins! Okay, let's search for the missing treasure and see if we're right!"*

For more information, contact
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