

# Maths in the Early Years

What to expect





# Aims of the session

- To outline the key areas of the Maths Curriculum with a focus on Early Learning Goals
- To share how children develop Maths skills across Early Years
- To give you some ideas of how you can support your child at home



## **Early Years Curriculum**







## **Mathematics**

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.



## **Development matters**

### Revised 2023

#### **Mathematics**

#### Three and Four-Year-Olds

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5.
- Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5.
- Compare quantities using language: 'more than', 'fewer than'.
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.
- Understand position through words alone for example, "The bag is under the table," – with no pointing.

#### **Mathematics**

#### Three and Four-Year-Olds

- Describe a familiar route.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Make comparisons between objects relating to size, length, weight and capacity.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Combine shapes to make new ones an arch, a bigger triangle, etc.
- Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Extend and create ABAB patterns stick, leaf, stick, leaf.
- Notice and correct an error in a repeating pattern.
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'

#### Mathematics

#### Children in Reception

- · Count objects, actions and sounds.
- Subitise.
- Link the number symbol (numeral) with its cardinal number value.
- · Count beyond ten.
- Compare numbers.
- Understand the 'one more than/one less than' relationship between consecutive numbers.
- Explore the composition of numbers to 10.
- Automatically recall number bonds for numbers 0–5 and some to 10.
- Select, rotate and manipulate shapes to develop spatial reasoning skills.
- Compose and decompose shapes so that children recognise a shape can have other shapes *within* it, just as numbers can.
- Continue, copy and create repeating patterns.
- Compare length, weight and capacity.

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Children need to be secure in these statements to meet their Early Learning Goal in Maths.

# Mathematics Early Learning Goals

## Number

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

## **Numerical Patterns**

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.



# How we cover Maths at Halling

- Daily carpet sessions linked to Maths
- Cross-curricular activities including outdoor opportunities
- Lots of talking
- Self-discovery
- Using concrete objects
- Asking questions
- Real life learning
- Practical and engaging lessons









Can you add two spoons of sugar? two cups of flour? Did we add more sugar or flour?



## This can look like....

Playground games such as 'What's the time, Mr Wolf?'

Spotting and creating patterns in the environment









I have 3 red and 2 yellow. Three and two make five altogether



How many big bricks do we have? How many small bricks? How many altogether?



Could you fill my cup half-way? Can we share the water fairly? We only have 1 banana, what could we do? How many segments of orange do you have? Is it the same/more or less than mine?





## Spotting patterns



Can you see a pattern? Tell me about it. What will come next?





Start patterns with blocks, beads, playing cards, and toys. Encourage your child to build on the pattern to make it longer. You could also look for patterns in time together (for example, seasons, months, or daily routines) and talk about what you notice, or listen for patterns in songs and clap the rhythm.









## I can see three!

I can see a two and a one!

I can see four!

I can see a two and a two!



# Subitising

I can see two!

I can see a one and a one!





## Let's see why subitising is important..





We will spend a lot of time, looking at individual numbers so that children have a deep understanding of numbers up to 10 and the compositio n of each number.





It's all about

the number

4!











# **Seeing number**

We follow a concrete, pictorial and abstract approach.



**Concrete** – handling real objects e.g. conkers , leaves, shells, toys etc.. Pictorial – Basic images to represent numbers eg, Numicon, wholepart models, drawings. Abstract – Written calculations





Number blocks is a great resource to use both in school and at home. The images and use of language that feature in each episode, serve as a useful starting point for developing basic number sense



# **Visual representations**

Children should have opportunities to develop basic number sense. A tens frame enable children to arrange concrete resources in a linear fashion. Children are able to recognise up to five items without counting (subitising). For six or more, a tens frame provides an image which will allow children to very quickly calculate the total.









We will begin to use these later, in the Reception year. Year One will use them throughout the year.

## Rekenreks

Encourage children to subitise, visualise number relationships, and strengthen counting proficiency Rekenreks are ideal for building number sense. They provide children with a concrete, physical object to help develop and deepen their understanding of numbers. Children build a strong sense of 5 and 10, learning about the relationships among numbers and operations along the way.

## Skills

Counting Adding and subtracting Composing and decomposing number Number sense Subitising





# Solving problems

Young children need problems that...

- They understand
- Where the outcome is relevant and matters to them- even if it is imaginary
- That involve mathematics with which they are confident









Using stories are a great way to involve Maths. We start each Maths lesson with a book that introduces or deepens their understanding of the concept that we are learning that day.



<section-header><section-header>Solving problemsThere are 10 loaves of bread in total.The Little Red Hen brought 4.The Bull brought 5.How many did the cat bring?



## Counting in 2's, 5's and 10's



Use every opportunity to use counting in 2's, 5's and 10's as you can. The more confident they come with number, the quicker they will spot and count in groups of number to improve fluency of counting.

Animals	Tally Marks		
tiger 🧖			
Giraffe	ult II		
Elephant	ur in		
Deer			

## **100 Number Square**

91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10



## Number bonds

By the end of Reception, children should know all number bonds to 5 and some up to 10. This video is Year 1 but will give you an idea of how we would apply this to 5 and what we are working towards.





Ten little monkeys jumping on the bed...

"First we had 10, then one fell off, so we have 9 left"



## Addition and subtraction

He scored one and I scored two. We scored three altogether. I scored more!





# We had six in the band but two left. Now we only have four!





He caught two and I caught two. We have four altogether!



# Now it's our turn to play!



# Who would like a game of bingo?





# Fun and practical ideas for home



## Let's go on a number hunt!

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# How many numbers have you spotted today, without even realising?







# Subitising fun

l can see a five and a one





I can see a one, a one, a one and a one





I can see a three

I can see a three, a two, a one and a one



How many so far? How many more until we get to the top?



Counting

I will pick up 5, can you pick up the same? 5+5=10



How many socks altogether? 2,4,6,8,10..

We have Mummy, Daddy, Nanny, Jessica, Ben and Abby. We need 6 of each



How many can you pick up in seconds?





# Sharing











Not only is sharing a useful activity for counting, it also introduces problem solving skills and the foundations for division. Key vocab fair, equal, same, share



## Number formation does not have to be boring....















# Spatial reasoning











## Money

Although we do not cover money in Reception, it can still encourage lots of fun and conversations around number.

> Can you get me three oranges and four bananas please?

How much do they cost?

What numbers can you see?











### 3 and 4-year-olds will be learning to:

#### Examples of how to support this:

Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').

Recite numbers past 5.

Say one number for each item in order: 1,2,3,4,5.

Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').

Show 'finger numbers' up to 5.

Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Point to small groups of two or three objects: "Look, there are two!" Occasionally ask children how many there are in a small set of two or three.

Regularly say the counting sequence, in a variety of playful contexts, inside and outdoors, forwards and backwards, sometimes going to high numbers. For example: hide and seek, rocket-launch countdowns.

Count things and then repeat the last number. For example: "1, 2, 3 - 3 **cars**". Point out the number of things whenever possible; so, rather than just 'chairs', 'apples' or 'children', say 'two chairs', 'three apples', 'four children'.

Ask children to get you several things and emphasise the total number in your conversation with the child.

Use small numbers to manage the learning environment. Suggestions: have a pot labelled '5 pencils' or a crate for '3 trucks'. Draw children's attention to these throughout the session and especially at tidy-up time: "How many pencils should be in this pot?" or "How many have we got?" etc.



Experiment with their own symbols and marks as well as numerals.

Solve real world mathematical problems with numbers up to 5.

Compare quantities using language: 'more than', 'fewer than'.

Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language:

'sides', 'corners'; 'straight', 'flat', 'round'.

Encourage children in their own ways of recording (for example) how many balls they managed to throw through the hoop. Provide numerals nearby for reference. Suggestions: wooden numerals in a basket or a number track on the fence.

Discuss mathematical ideas throughout the day, inside and outdoors. Suggestions:

- "I think Jasmin has got more crackers..."
- support children to solve problems using fingers, objects and marks: "There are four of you, but there aren't enough chairs...."
- draw children's attention to differences and changes in amounts, such as those in stories like 'The Enormous Turnip'.

Encourage children to play freely with blocks, shapes, shape puzzles and shape-sorters.

Sensitively support and discuss questions like: "What is the same and what is different?"

Encourage children to talk informally about shape properties using words like 'sharp corner', 'pointy' or 'curvy'. Talk about shapes as you play with them: "We need a piece with a straight edge."

3 and 4-year-olds will be learning to:

**Examples of how to support this:** 

Understand position through words alone – for example, "The bag is under the table," – with no pointing.

Describe a familiar route.

Discuss routes and locations, using words like 'in front of' and 'behind'.

Make comparisons between objects relating to size, length, weight and capacity.

Discuss position in real contexts. Suggestions: how to shift the leaves **off** a path or sweep water away **down** the drain.

Use spatial words in play, including 'in', 'on', 'under', 'up', 'down', 'besides' and 'between'. Suggestion: "Let's put the troll under the bridge and the billy goat beside the stream."

Take children out to shops or the park: recall the route and the order of things seen on the way.

Set up obstacle courses, interesting pathways and hiding places for children to play with freely. When appropriate, ask children to describe their route and give directions to each other.

Provide complex train tracks, with loops and bridges, or water-flowing challenges with guttering that direct the flow to a water tray, for children to play freely with.

Read stories about journeys, such as 'Rosie's Walk'.

Provide experiences of size changes. Suggestions: "Can you make a puddle larger?", "When you squeeze a sponge, does it stay small?", "What happens when you stretch dough, or elastic?"

Talk with children about their everyday ways of comparing size, length, weight and capacity. Model more specific techniques, such as lining up ends of lengths and straightening ribbons, discussing accuracy: "Is it **exactly**...?"



Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.

Combine shapes to make new ones – an arch, a bigger triangle, etc.

Provide a variety of construction materials like blocks and interlocking bricks. Provide den-making materials. Allow children to play freely with these materials, outdoors and inside. When appropriate, talk about the shapes and how their properties suit the purpose.

Provide shapes that combine to make other shapes, such as pattern blocks and interlocking shapes, for children to play freely with. When appropriate, discuss the different designs that children make.

Occasionally suggest challenges, so that children build increasingly more complex constructions.

Use tidy-up time to match blocks to silhouettes or fit things in containers, describing and naming shapes. Suggestion: "Where does this triangular one /cylinder /cuboid go?"



#### **Examples of how to support this:**

Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.

Extend and create ABAB patterns – stick, leaf, stick, leaf.

Notice and correct an error in a repeating pattern.

Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'

Provide patterns from different cultures, such as fabrics.

Provide a range of natural and everyday objects and materials, as well as blocks and shapes, for children to play with freely and to make patterns with. When appropriate, encourage children to continue patterns and spot mistakes.

Engage children in following and inventing movement and music patterns, such as clap, clap, stamp.

Talk about patterns of events, in cooking, gardening, sewing or getting dressed. Suggestions:

- 'First', 'then', 'after', 'before'
- "Every day we..."
- "Every evening we..."

Talk about the sequence of events in stories.

Use vocabulary like 'morning', 'afternoon', 'evening' and 'night-time', 'earlier', 'later', 'too late', 'too soon', 'in a minute'.

Count down to forthcoming events on the calendar in terms of number of days or sleeps. Refer to the days of the week, and the day before or day after, 'yesterday' and 'tomorrow'.



Count objects, actions and sounds.

#### Examples of how to support this:

Develop the key skills of counting objects including saying the numbers in order and matching one number name to each item.

Say how many there are after counting – for example, "...6, 7, 8. There are **8 balls**" – to help children appreciate that the last number of the count indicates the total number of the group. This is the cardinal counting principle.

Say how many there might be before you count to give a purpose to counting: "I think there are about 8. Shall we count to see?"

Count out a smaller number from a larger group: "Give me seven..." Knowing when to stop shows that children understand the cardinal principle.

Build counting into everyday routines such as register time, tidying up, lining up or counting out pieces of fruit at snack time.

Sing counting songs and number rhymes and read stories that involve counting.

Play games which involve counting.

Identify children who have had less prior experience of counting and provide additional opportunities for counting practice.

	Children in reception will b	e
~	learning to:	

Subitise.

Examples of now to support this	Example	s of how	to sup	port thi	is:
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Show small quantities in familiar patterns (for example, dice) and random arrangements.

Play games which involve quickly revealing and hiding numbers of objects.

Put objects into five frames and then ten frames to begin to familiarise children with the tens structure of the number system.

Prompt children to subitise first when enumerating groups of up to 4 or 5 objects: "I don't think we need to count those. They are in a square shape so there must be 4." Count to check.

Encourage children to show a number of fingers 'all at once', without counting.

Display numerals in order alongside dot quantities or tens frame arrangements.

Play card games such as snap or matching pairs with cards where some have numerals, and some have dot arrangements.

Discuss the different ways children might record quantities (for example, scores in games), such as tallies, dots and using numeral cards.

Link the number symbol (numeral) with its cardinal number value.



#### Count beyond ten. Count verbally beyond 20, pausing at each multiple of 10 to draw out the structure, for instance when playing hide and seek, or to time children getting ready. Provide images such as number tracks, calendars and hundred squares indoors and out, including painted on the ground, so children become familiar with two-digit numbers and can start to spot patterns within them. Compare numbers. Provide collections to compare, starting with a very different number of things. Include more small things and fewer large things, spread them out and bunch them up, to draw attention to the number not the size of things or the space they take up. Include groups where the number of items is the same. Use vocabulary: 'more than', 'less than', 'fewer', 'the same as', 'equal to'. Encourage children to use these words as well. Distribute items evenly, for example: "Put 3 in each bag," or give the same number of pieces of fruit to each child. Make deliberate mistakes to provoke discussion. Tell a story about a character distributing snacks unfairly and invite children to make sure everyone has the same. Understand the 'one more than/one less than' Make predictions about what the outcome will be in stories, rhymes and songs if one is added, or if one is taken away. relationship between consecutive numbers. Provide 'staircase' patterns which show that the next counting number includes the previous number plus one.

#### Examples of how to support this:



Examples of how to support this:

Explore the composition of numbers to 10.

Focus on composition of 2, 3, 4 and 5 before moving onto larger numbers

Provide a range of visual models of numbers: for example, six as double three on dice, or the fingers on one hand and one more, or as four and two with ten frame images.

Model conceptual subitising: "Well, there are three here and three here, so there must be six."

Emphasise the parts within the whole: "There were 8 eggs in the incubator. Two have hatched and 6 have not yet hatched."

Plan games which involve partitioning and recombining sets. For example, throw 5 beanbags, aiming for a hoop. How many go in and how many don't?



Automatically recall number bonds for numbers 0–5 and some to 10.

#### Examples of how to support this:

Have a sustained focus on each number to and within 5. Make visual and practical displays in the classroom showing the different ways of making numbers to 5 so that children can refer to these.

Help children to learn number bonds through lots of hands-on experiences of partitioning and combining numbers in different contexts, and seeing subitising patterns.

Play hiding games with a number of objects in a box, under a cloth, in a tent, in a cave, etc.: "6 went in the tent and 3 came out. I wonder how many are still in there?"

Intentionally give children the wrong number of things. For example: ask each child to plant 4 seeds then give them 1, 2 or 3. "I've only got 1 seed, I need 3 more."

Spot and use opportunities for children to apply number bonds: "There are 5 of us but only 2 clipboards. How many more do we need?"

Place objects into a five frame and talk about how many spaces are filled and unfilled.



#### Examples of how to support this:

Select, rotate and manipulate shapes to develop spatial reasoning skills.	Provide high-quality pattern and building sets, including pattern blocks, tangrams, building blocks and magnetic construction tiles, as well as found materials. Challenge children to copy increasingly complex 2D pictures and patterns with these 3D resources, guided by knowledge of learning trajectories: "I bet you can't add an arch to that," or "Maybe tomorrow someone will build a staircase." Teach children to solve a range of jigsaws of increasing challenge.
Compose and decompose shapes so that children recognise a shape can have other shapes <i>within</i> it, just as numbers can.	Investigate how shapes can be combined to make new shapes: for example, two triangles can be put together to make a square. Encourage children to predict what shapes they will make when paper is folded. Wonder aloud how many ways there are to make a hexagon with pattern blocks. Find 2D shapes within 3D shapes, including through printing or shadow play.
Continue, copy and create repeating patterns.	Make patterns with varying rules (including AB, ABB and ABBC) and objects and invite children to continue the pattern. Make a deliberate mistake and discuss how to fix it.
Compare length, weight and capacity.	Model comparative language using 'than' and encourage children to use this vocabulary. For example: "This is heavier than that." Ask children to make and test predictions. "What if we pour the jugful into the teapot? Which holds more?"