



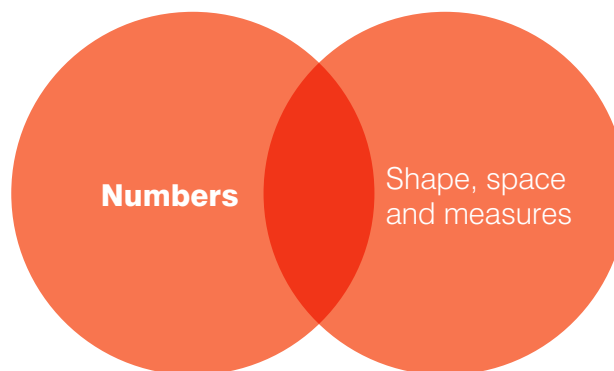
Mathematics: Numbers

Introduction

Mathematics (M) is one of the **four specific areas** of learning in the EYFS framework. It involves providing children with opportunities to practise and improve their skills in counting on and counting back, and using numbers up to 20 to do simple addition and subtraction to solve simple problems.

Mathematics also involves children using everyday language to describe and compare size, weight, capacity, time, position, and distance. They are given opportunities to know, and talk about, patterns and the properties of flat and solid shapes.

In the EYFS framework **Mathematics** is made up of two aspects:



Prime and specific areas of learning

- The **three prime areas** of the EYFS are Personal, Social and Emotional Development (PSED), Physical Development (PD) AND Communication and Language (CL).
- The **four specific areas** are Literacy (L), Mathematics (M), Understanding the World (UW) and Expressive Arts and Design (EAD).
- The **three prime areas** should be the focus for practitioners working with the youngest children, as these form the basis for successful learning and progress in the **four specific areas**.
- As children become older, the emphasis will shift towards a more equal focus on **all areas of learning** as children's confidence and abilities increase.

Supporting young children's development in numbers

Mathematics covers the area of learning and development which was previously called 'Problem solving, reasoning and numeracy' in the original EYFS framework.

Numbers covers the previous aspects 'Numbers as Labels and for Counting' and 'Calculating'.

Developing an understanding of numbers allows children to solve problems, generate new questions, and make connections across other areas of learning and development. Practitioners can support this area of learning by exploiting the mathematical potential of the indoor environment. Children can discover the importance of numbers

by recognising numerals and by counting and calculating to solve simple practical problems; such as finding out how many children are in the role play area, or working out how many plates and spoons a group of children needs.

Progress in M Numbers

Under 3s

'Practitioners working with the youngest children should focus on the prime areas, but also recognise that the foundations of all areas of learning are laid from birth – for example mathematics through early experiences of quantity and spatial relationships.'

[Tickell Review of the EYFS, 2011]

Early Learning Goal for Numbers

'Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.'

[Statement from revised draft EYFS Framework, 2011]

What quality looks like in practice

The following three scenarios describe how the practice in a day nursery in a suburban area supports young children's learning and development in numbers and counting.

Under twos

The baby and toddler rooms in the nursery include a variety of resources which support the children's development of understanding of numbers and counting. Treasure Basket collections are provided which encourage the youngest babies to handle large quantities of interesting objects made from natural materials. Smaller baskets contain handling collections of three or four items which may be identical or connected in some way. The collections include balls, spoons, cotton reels or scarves for the babies to handle independently. The practitioners observe closely the ways in which individual children select and handle the items in the Treasure Basket collections – how they choose and discard objects, how they line them up, how they put them inside one another or put them into piles. Very young babies demonstrate their own unique learning styles and sometimes appear to be ordering and sorting the objects in a logical manner.

Once the babies are mobile, the practitioners extend their heuristic play by providing a range of resources such as bottles, boxes, tins, pegs, shells, stones, wooden balls, shapes, and rings to enable the children to practise building, sorting, ordering, filling, emptying, posting, and transporting. All of these activities encourage the toddlers to begin to develop their understanding of numbers, counting, and calculating.

The practitioners introduce counting songs and rhymes to the babies and toddlers, singing 'Round and round the garden like a teddy bear', 'This little piggy went to market' and 'Once I caught a fish alive.'

Two- to three-year-olds

The practitioners who work with the two- and three-year-olds have provided an enabling environment which encourages mathematical exploration and thinking. The home bases for the two- and three-year-olds are upstairs in the nursery, and the practitioners have used brass door numbers on each of the stair treads so that the children can count forwards and backwards as they make their regular trips up and down the stairs during the day.

The indoor environment includes a range of mirrors – behind the construction area, placed at right angles to one another near the reclaimed and natural materials, and flat on the table for the children to use when placing and arranging. As well as developing their spatial awareness, the mirrors encourage the children to recognise and count different quantities, to use the language of counting such as 'lots', 'more' or 'less', and to create patterns and arrangements with different quantities of objects.

Out of doors the environment has been planned to encourage counting – paths are created using stepping stones; bricks, planks and large stones are used for construction; buckets and bags are provided for collecting and sorting natural materials; games and equipment such as skittles and quoits are freely accessible. At every opportunity the practitioners engage in playful counting and calculating with the children, as well as joining in hopscotch and giant snakes and ladders marked out on the hard surfaced play area.

Four- to five-year-olds

The practitioners working with the older children have created an environment which is number rich – number lines up to 20 which reflect the children's interests are placed at child height; an interesting variety of bought, natural and reclaimed materials are readily available for children to use in counting and problem solving; signs show how many children can play in the role play area or in the water tray at any one time.

Number rhymes and songs, number games both indoors and out of doors, and daily events such as snack time and lunch time all provide opportunities for the practitioners to encourage the children to problem solve and to use the vocabulary involved in counting, adding and subtracting. Children are encouraged to invent their own problems for the other children to solve.

Practitioners provide the resources and opportunities for the children to record their mathematical problems using symbols and numerals. These include mark making materials, clipboards, calculators, and timers, which can be used during role play, in construction, in outdoor games, or when planning changes to the outdoor or indoor environments such as deciding what plants to grow in the flowerbeds or vegetable garden.

How to help young children develop their skills with numbers

Use these reflective questions to think about how you might support young children to develop their skills with numbers.

Under twos

- Do all practitioners working with the under twos have the professional knowledge to recognise and develop children's interests and abilities in activities which support their learning and development with numbers?
- Are the learning environments in baby and toddler rooms used to their best advantage to provide opportunities for mathematical development in numbers and counting?
- Do babies have access to a range of Treasure Basket collections of interesting objects to handle which enable practitioners to observe children's unique learning styles?
- Once they are mobile, do toddlers have regular heuristic play sessions which encourage them to begin to develop their understanding of numbers, counting, and calculating?
- Do all staff working with babies and toddlers know and use a range of number songs and games, to play with even the youngest children?
- Are number activities, such as counting toes and fingers, used by practitioners in a playful way?
- Are we good at taking advantage of the opportunities to develop number skills, which are presented in everyday activities such as giving each toy a cup or matching buttons to buttonholes?
- As a setting, do we provide parents with clear information which tells them about the mathematical skills babies and young children are developing when they explore Treasure Baskets and heuristic play?

Two- to three-year-olds

- Do all practitioners working with two- and three-year-olds provide an enabling environment which encourages mathematical exploration and thinking?
- As staff, do we have a shared understanding of the value of making numbers and counting fun?
- Do all staff make the most of everyday experiences to develop children's number skills – counting the stairs as we go up and down; recognising numerals in books, pictures and birthday cards; talking about how many children are in the group and how many are missing?
- Could we do more to present children with activities which encourage problem-solving using numbers?
- When we talk to young children, do we take every possible opportunity to use number words such as 'lots', 'few', 'more' or 'less'?
- Do we provide number resources which are appropriate to the children's stages of development?
- Is the outdoor environment used to encourage number recognition, counting, and sorting; for example when playing hopscotch, skittles or quoits?
- How can we make sure that parents are aware of the importance of using everyday experiences to help their children's learning and development in numbers?

Four- to five-year-olds

- Are all members of staff confident in their own mathematical ability? If not, what can be done to help them?
- Do all practitioners create a learning environment which is number rich? Are numerals displayed in purposeful contexts such as showing how many children can play in the role play area or at the water tray at one time?
- Do all staff have a rich repertoire of number rhymes, songs, and games which they use with the children daily?
- Could we make more of opportunities to use mathematical vocabulary, which is becoming increasingly complex as the children's number skills and understanding develops?
- How well do we succeed in interesting both boys and girls in mathematical problem solving - selecting resources for counting and sorting which will attract both boys and girls; encouraging counting and number recognition in superhero play; posing problems which involve princess and fairy characters?
- How often do we involve the children in solving problems in our setting – deciding how many cups, plates and bowls are needed at lunchtime; measuring how much paper we need for a display; finding out how many children are in nursery each morning?
- Do we show interest in how children solve problems and how they record the processes they use?
- How could we involve parents in using daily experiences such as shopping, travelling to nursery, or having lunch in a café to develop number skills?

Ideas for parents

Children can learn about numbers and how to use them from a very early age. There are many opportunities in daily routines and activities for recognising numbers, counting, and solving simple number problems.

Helping your child to develop their skills with numbers

There are lots of easy ways you can help your child to develop their skills with numbers.

You could use the ideas below as starting points to help you do this.

Under twos

- Give your baby or toddler collections of everyday objects to play with – spoons, scarves, balls, clothes pegs, or small boxes.
- Play games where you hide objects under a tea towel or magazine for your child to find.
- Older babies enjoy putting smaller objects such as shells or stones inside boxes, bags, or tins which you provide.
- Watch the different ways your child sorts objects into piles or into the containers.
- Sing counting songs and rhymes to your baby or toddler such as 'Round and round the garden like a teddy bear' or 'This little piggy went to market.'
- When you talk to your baby or toddler use number words in the conversation.
- At bath time, have fun counting toes and fingers – yours and your child's.

Two- to three-year-olds

- Borrow library books which have a counting theme to them – many of them ask the reader to count to ten and back again.
- Count the stairs as you go up and down them.
- At breakfast or lunch time, ask your child to help you to set the table with the right number of cups, bowls, and plates for each member of the family.
- When you are getting ready to go out, encourage your child to check that they have the right buttons in the correct button holes. Count them as you fasten your coats.
- Use the language of numbers with your child, such as 'lots', 'more', 'less', or 'none'.
- When you go out for a walk, look for numbers you find where you live – door numbers, numbers on buses, in shop windows, or in the supermarket.
- When you go to the park, play hopscotch together, count the steps on the slide, and the number of 'pushes' on the swing.

Four- to five-year-olds

- Talk to your child about numbers in the environment when you see them – on road signs, on front doors, in shop windows.
- Help your child to make birthday cards with special numbers for different members of your family and friends.
- Play games such as snakes and ladders, lotto, cards, and dominoes which require counting and number recognition.
- When you go shopping, ask your child to pass you the required number of items to put in your basket or trolley. Count them again when you get home.
- Use opportunities to count with your child when you are at home together cooking, baking, planting bulbs and seeds, or tidying up at the end of the day.
- Ask your child if they can think of ways to solve number problems – how many slices will you cut the pizza into, how many knives and forks do you need for dinner, or how many invitations do you need to invite all of his friends to his birthday party?
- Try counting aloud when you lay games out of doors such as hide and seek, 'What time is it Mr Wolf?', skipping, or scoring goals.