

Mathematics: Numbers

	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 Birth - 11 months	<ul style="list-style-type: none"> Notices changes in number of objects/images or sounds in group of up to 3. 	<ul style="list-style-type: none"> Sing number rhymes as you dress or change babies, e.g. 'One, Two, Buckle My Shoe'. Move with babies to the rhythm patterns in familiar songs and rhymes. Encourage babies to join in tapping and clapping along to simple rhythms. 	<ul style="list-style-type: none"> Display favourite things so that a young baby can see them. Provide a small group of the same objects in treasure baskets, as well as single items, e.g. two fir cones or three shells. Create a mobile, occasionally changing the number of items you hang on it. Collect number rhymes which are repetitive and are related to children's actions and experiences, for example, 'Peter Hammers with One Hammer'. Use song and rhymes during personal routines, e.g. 'Two Little Eyes to Look Around', pointing to their eyes, one by one. Collect number and counting rhymes from a range of cultures and in other languages. This will benefit all children and will give additional support for children learning English as an additional language.
 8-20 months	<ul style="list-style-type: none"> Develops an awareness of number names through their enjoyment of action rhymes and songs that relate to their experience of numbers. Has some understanding that things exist, even when out of sight. 		
 16-26 months	<ul style="list-style-type: none"> Knows that things exist, even when out of sight. Beginning to organise and categorise objects, e.g. putting all the teddy bears together or teddies and cars in separate piles. Says some counting words randomly. 	<ul style="list-style-type: none"> Use number words in meaningful contexts, e.g. 'Here is your other mitten. Now we have two'. Talk to young children about 'lots' and 'few' as they play. Talk about young children's choices and, where appropriate, demonstrate how counting helps us to find out how many. Talk about the maths in everyday situations, e.g. doing up a coat, one hole for each button. Tell parents about all the ways children learn about numbers in your setting. Have interpreter support or translated materials to support children and families learning English as an additional language 	<ul style="list-style-type: none"> Provide varied opportunities to explore 'lots' and 'few' in play. Equip the role-play area with things that can be sorted in different ways. Provide collections of objects that can be sorted and matched in various ways. Provide resources that support children in making one-to-one correspondences, e.g. giving each dolly a cup.
 22-36 months	<ul style="list-style-type: none"> Selects a small number of objects from a group when asked, for example, 'please give me one', 'please give me two'. Recites some number names in sequence. Creates and experiments with symbols and marks representing ideas of number. Begins to make comparisons between quantities. Uses some language of quantities, such as 'more' and 'a lot'. Knows that a group of things changes in quantity when something is added or taken away. 	<ul style="list-style-type: none"> Encourage parents of children learning English as an additional language to talk in their home language about quantities and numbers. Sing counting songs and rhymes which help to develop children's understanding of number, such as 'Two Little Dickie Birds'. Play games which relate to number order, addition and subtraction, such as hopscotch and skittles and target games. 	<ul style="list-style-type: none"> Make a display with the children about their favourite things. Talk about how many like apples, or which of them watches a particular TV programme at home. Provide props for children to act out counting songs and rhymes. Provide games and equipment that offer opportunities for counting, such as skittles. Plan to incorporate a mathematical component in areas such as the sand, water or other play areas.

Children develop at their own rates, and in their own ways. The development statements and their order should not be taken as necessary steps for individual children. They should not be used as checklists. The age/stage bands overlap because these are not fixed age boundaries but suggest a typical range of development.

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	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 30-50 months	<ul style="list-style-type: none"> • Uses some number names and number language spontaneously. • Uses some number names accurately in play. • Recites numbers in order to 10. • Knows that numbers identify how many objects are in a set. • Beginning to represent numbers using fingers, marks on paper or pictures. • Sometimes matches numeral and quantity correctly. • Shows curiosity about numbers by offering comments or asking questions. • Compares two groups of objects, saying when they have the same number. • Shows an interest in number problems. • Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same. • Shows an interest in numerals in the environment. • Shows an interest in representing numbers. • Realises not only objects, but anything can be counted, including steps, claps or jumps. 	<ul style="list-style-type: none"> • Use number language, e.g. 'one', 'two', 'three', 'lots', 'fewer', 'hundreds', 'how many?' and 'count' in a variety of situations. • Support children's developing understanding of abstraction by counting things that are not objects, such as hops, jumps, clicks or claps. • Model counting of objects in a random layout, showing the result is always the same as long as each object is only counted once. • Model and encourage use of mathematical language e.g. asking questions such as 'How many saucepans will fit on the shelf?' • Help children to understand that one thing can be shared by number of pieces, e.g. a pizza. • As you read number stories or rhymes, ask e.g. 'When one more frog jumps in, how many will there be in the pool altogether?' • Use pictures and objects to illustrate counting songs, rhymes and number stories. • Encourage children to use mark-making to support their thinking about numbers and simple problems. • Talk with children about the strategies they are using, e.g. to work out a solution to a simple problem by using fingers or counting aloud. 	<ul style="list-style-type: none"> • Give children a reason to count, e.g. by asking them to select enough wrist bands for three friends to play with the puppets. • Enable children to note the 'missing set', e.g. 'There are none left' when sharing things out. • Provide number labels for children to use, e.g. by putting a number label on each bike and a corresponding number on each parking space. • Include counting money and change in role-play games. • Create opportunities for children to separate objects into unequal groups as well as equal groups. • Provide story props that children can use in their play, e.g. varieties of fruit and several baskets like Handa's in the story <i>Handa's Surprise</i> by Eileen Browne.
 40-60+ months	<ul style="list-style-type: none"> • Recognise some numerals of personal significance. • Recognises numerals 1 to 5. • Counts up to three or four objects by saying one number name for each item. • Counts actions or objects which cannot be moved. • Counts objects to 10, and beginning to count beyond 10. • Counts out up to six objects from a larger group. 	<ul style="list-style-type: none"> • Encourage estimation, e.g. estimate how many sandwiches to make for the picnic. • Encourage use of mathematical language, e.g. number names to ten: 'Have you got enough to give me three?' • Ensure that children are involved in making displays, e.g. making their own pictograms of lunch choices. Develop this as a 3D representation using bricks and discuss the most popular choices. • Add numerals to all areas of learning and development, e.g. to a display of a favourite story, such as 'The Three Billy Goats Gruff'. 	<ul style="list-style-type: none"> • Provide collections of interesting things for children to sort, order, count and label in their play. • Display numerals in purposeful contexts, e.g. a sign showing how many children can play on a number track. • Use tactile numeral cards made from sandpaper, velvet or string. • Create opportunities for children to experiment with a number of objects, the written numeral and the written number word. Develop this through matching activities with a range of numbers, numerals and a selection of objects.

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	<ul style="list-style-type: none"> • Selects the correct numeral to represent 1 to 5, then 1 to 10 objects. • Counts an irregular arrangement of up to ten objects. • Estimates how many objects they can see and checks by counting them. • Uses the language of 'more' and 'fewer' to compare two sets of objects. • Finds the total number of items in two groups by counting all of them. • Says the number that is one more than a given number. • Finds one more or one less from a group of up to five objects, then ten objects. • In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. • Records, using marks that they can interpret and explain. • Begins to identify own mathematical problems based on own interests and fascinations. <p>Early Learning Goal</p> <p>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.</p>	<ul style="list-style-type: none"> • Make books about numbers that have meaning for the child such as favourite numbers, birth dates or telephone numbers. • Use rhymes, songs and stories involving counting on and counting back in ones, twos, fives and tens. • Emphasise the empty set and introduce the concept of nothing or zero. • Show interest in how children solve problems and value their different solutions. • Make sure children are secure about the order of numbers before asking what comes after or before each number. • Discuss with children how problems relate to others they have met, and their different solutions. • Talk about the methods children use to answer a problem they have posed, e.g. <i>'Get one more, and then we will both have two.'</i> • Encourage children to make up their own story problems for other children to solve. • Encourage children to extend problems, e.g. <i>"Suppose there were three people to share the bricks between instead of two"</i>. • Use mathematical vocabulary and demonstrate methods of recording, using standard notation where appropriate. • Give children learning English as additional language opportunities to work in their home language to ensure accurate understanding of concepts. 	<ul style="list-style-type: none"> • Use a 100 square to show number patterns. • Encourage children to count the things they see and talk about and use numbers beyond ten • Make number games readily available and teach children how to use them. • Display interesting books about number. • Play games such as hide and seek that involve counting. • Encourage children to record what they have done, e.g. by drawing or tallying. • Use number staircases to show a starting point and how you arrive at another point when something is added or taken away. • Provide a wide range of number resources and encourage children to be creative in identifying and devising problems and solutions in all areas of learning. • Make number lines available for reference and encourage children to use them in their own play. • Big number lines may be more appropriate than counters for children with physical impairments. • Help children to understand that five fingers on each hand make a total of ten fingers altogether, or that two rows of three eggs in the box make six eggs altogether.

Mathematics: Shape, space and measure			
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 Birth - 11 months	<p><i>Babies' early awareness of shape, space and measure grows from their sensory awareness and opportunities to observe objects and their movements, and to play and explore.</i></p> <p>See Characteristics of Effective Learning - Playing and Exploring, <i>and</i> Physical Development.</p>	<p>See Characteristics of Effective Learning - Playing and Exploring, <i>and</i> Physical Development.</p>	<p>See Characteristics of Effective Learning - Playing and Exploring, <i>and</i> Physical Development.</p>
 8-20 months	<ul style="list-style-type: none"> • Recognises big things and small things in meaningful contexts. • Gets to know and enjoy daily routines, such as getting-up time, mealtimes, nappy time, and bedtime. 	<ul style="list-style-type: none"> • Play games that involve curling and stretching, popping up and bobbing down. • Encourage babies' explorations of the characteristics of objects, e.g. by rolling a ball to them. • Talk about what objects are like and how objects, such as a sponge, can change their shape by being squeezed or stretched. 	<ul style="list-style-type: none"> • Provide a range of objects of various textures and weights in treasure baskets to excite and encourage babies' interests. • Look at books showing objects such as a big truck and a little truck; or a big cat and a small kitten. • Use story props to support all children and particularly those learning English as an additional language.
 16-26 months	<ul style="list-style-type: none"> • Attempts, sometimes successfully, to fit shapes into spaces on inset boards or jigsaw puzzles. • Uses blocks to create their own simple structures and arrangements. • Enjoys filling and emptying containers. • Associates a sequence of actions with daily routines. • Beginning to understand that things might happen 'now'. 	<ul style="list-style-type: none"> • Use 'tidy up time' to promote logic and reasoning about where things fit in or are kept. • Talk to children, as they play with water or sand, to encourage them to think about when something is full, empty or holds more. • Help young children to create different arrangements in the layout of road and rail tracks. • Highlight patterns in daily activities and routines. • Help children use their bodies to explore shape, through touching, seeing and feeling shape in art, music and dance. 	<ul style="list-style-type: none"> • Encourage children, when helping with domestic tasks, to put all the pieces of apple on one dish and all the pieces of celery on another for snacks. • Use pictures or shapes of objects to indicate where things are kept and encourage children to work out where things belong. • Provide different sizes and shapes of containers in water play, so that children can experiment with quantities and measures. • Offer a range of puzzles with large pieces and knobs or handles to support success in fitting shapes into spaces.
 22-36 months	<ul style="list-style-type: none"> • Notices simple shapes and patterns in pictures. • Beginning to categorise objects according to properties such as shape or size. • Begins to use the language of size. • Understands some talk about immediate past and future, e.g. 'before', 'later' or 'soon'. • Anticipates specific time-based events such as mealtimes or home time. 	<ul style="list-style-type: none"> • Talk about and help children to recognise patterns. • Draw children's attention to the patterns e.g. square/oblong/square which emerges as you fold or unfold a tablecloth or napkin. • Use descriptive words like 'big' and 'little' in everyday play situations and through books and stories. • Be consistent in your use of vocabulary for weight and mass. 	<ul style="list-style-type: none"> • Collect pictures that illustrate the use of shapes and patterns from a variety of cultures, e.g. Arabic designs. • Provide opportunities for children to measure time (sand timer), weight (balances) and length (standard and non-standard units). • Vary the volume and capacity equipment in the sand, water and other play areas to maintain interest. • Use coins for sorting on play trays and into bags, purses and containers.

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 30-50 months	<ul style="list-style-type: none"> Shows an interest in shape and space by playing with shapes or making arrangements with objects. Shows awareness of similarities of shapes in the environment. Uses positional language. Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. Shows interest in shapes in the environment. Uses shapes appropriately for tasks. Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'. 	<ul style="list-style-type: none"> Demonstrate the language for shape, position and measures in discussions, e.g. 'sphere', 'shape', 'box', 'in', 'on', 'inside', 'under', long, longer', 'longest', 'short', shorter', 'shortest', 'heavy', 'light', 'full' and 'empty'. Find out and use equivalent terms for these in home languages. Encourage children to talk about the shapes they see and use and how they are arranged and used in constructions. Value children's constructions, e.g. helping to display them or taking photographs of them. 	<ul style="list-style-type: none"> Measure for a purpose, such as finding out whether a teddy will fit in a bed. Organise the environment to foster shape matching, e.g. pictures of different bricks on containers to show where they are kept. Have large and small blocks and boxes available for construction both indoors and outdoors. Play games involving children positioning themselves <i>inside, behind, on top</i> and so on. Provide rich and varied opportunities for comparing length, weight, capacity and time. Use stories such as <i>Rosie's Walk</i> by Pat Hutchins to talk about distance and stimulate discussion about non-standard units and the need for standard units. Show pictures that have symmetry or pattern and talk to children about them.
 40-60+ months	<ul style="list-style-type: none"> Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Can describe their relative position such as 'behind' or 'next to'. Orders two or three items by length or height. Orders two items by weight or capacity. Uses familiar objects and common shapes to create and recreate patterns and build models. Uses everyday language related to time. Beginning to use everyday language related to money. Orders and sequences familiar events. Measures short periods of time in simple ways. <p>Early Learning Goal Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</p>	<ul style="list-style-type: none"> Ask 'silly' questions, e.g. show a tiny box and ask if there is a bicycle in it. Play peek-a-boo, revealing shapes a little at a time and at different angles, asking children to say what they think the shape is, what else it could be or what it could not be. Be a robot and ask children to give you instructions to get to somewhere. Let them have a turn at being the robot for you to instruct. Introduce children to the use of mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and the mathematical terms to describe shapes. Encourage children to use everyday words to describe position, e.g. when following pathways or playing with outdoor apparatus. 	<ul style="list-style-type: none"> Make books about shape, time and measure: shapes found in the environment; long and short things; things of a specific length; and ones about patterns, or comparing things that are heavier or lighter. Have areas where children can explore the properties of objects and where they can weigh and measure, such as a cookery station or a building area. Plan opportunities for children to describe and compare shapes, measures and distance. Provide materials and resources for children to observe and describe patterns in the indoor and outdoor environment and in daily routines. Provide a range of natural materials for children to arrange, compare and order.

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