

# Developmental Stages in Learning for Foundation Stage

## USING MATHEMATICS Continuum

Teachers should provide opportunities for pupils to use the skill of Using Mathematics across the curriculum in play, topic work and all Areas of Learning. The statements that begin 'the teacher' and 'the pupils' are examples only. They describe **possible** teacher action and pupil behaviour to illustrate each stage.

### Requirements for Using Mathematics

Across the curriculum, at a level appropriate to their ability, pupils should be enabled to:

- choose the appropriate materials, equipment and mathematics to use in a particular situation;
- use mathematical knowledge and concepts accurately;
- work systematically and check their work;
- use mathematics to solve problems and make decisions;
- develop methods and strategies, including mental mathematics;
- explore ideas, make and test predictions and think creatively;
- identify and collect information;
- read, interpret, organise and present information in mathematical formats;
- use mathematical understanding and language to ask and answer questions, talk about and discuss ideas and explain ways of working.<sup>1</sup>

From	To	Expansion of the Levels of Progression: Level 1
<b>Pupils can:</b>	<b>Pupils can:</b>	<b>In structured activities, in familiar and accessible contexts, pupils can:</b>
<ul style="list-style-type: none"> <li>• <b>explore materials and equipment;</b> The teacher provides opportunities for pupils to explore a wide range of materials and equipment, for example free access to materials and equipment including ICT throughout the day. <b>Assessment opportunity:</b> The pupils are curious and explore a wide range of materials and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>explore and talk about materials and equipment;</b> The teacher models and shares the appropriate use of materials and equipment for particular activities, for example illustrating how a pan balance or digital device works. <b>Assessment opportunity:</b> The pupils use and talk about the materials and equipment provided.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>talk about and use the materials and equipment provided to carry out an activity;</b> Pupils can, with teacher direction, use mathematical materials and equipment provided, for example:                             <ul style="list-style-type: none"> <li>– make their own repeated pattern using sets of shapes or beads;</li> <li>– sort real objects for one criterion, for example colour, shape or size; and</li> <li>– use balance scales to find which object is heavier.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>become aware of mathematical notation;</b> The teacher models and shares appropriate mathematical notation, such as mathematical symbols in the environment, for example pointing to individual numbers during rote counting activities. <b>Assessment opportunity:</b> The pupils recognise and use marks with mathematical significance, for example making marks to represent different numbers.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>begin to use some mathematical notation;</b> The teacher models and shares the correct formation of numerals and symbols.  <b>Assessment opportunity:</b> The pupils demonstrate the correct formation of numerals and symbols.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>use some mathematical notation;</b> Pupils can:                             <ul style="list-style-type: none"> <li>– match numerals to sets up to 10, including 0 to the empty set; and</li> <li>– record their work using numerals or words to 10.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>appreciate the need to be organised;</b> The teacher models and shares the need for organisation, for example a tidy-up-time routine. <b>Assessment opportunity:</b> The pupils demonstrate an element of organisation, for example participating in the tidy-up-time routine.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>follow instructions to organise themselves;</b> The teacher gives instructions during practical work/play. <b>Assessment opportunity:</b> The pupils carry out instructions successfully.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>show some organisation in their practical work;</b> Pupils can organise practical work, for example:                             <ul style="list-style-type: none"> <li>– arrange objects into organised groupings; and</li> <li>– match objects to find which group has more/fewer.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>become aware of simple everyday problems;</b> The teacher talks about scenarios where problems occur, for example 'How will we find out which clothes will fit teddy?' <b>Assessment opportunity:</b> The pupils talk about a variety of different problems.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>recognise and begin to solve simple everyday problems;</b> The teacher models and shares solving simple everyday problems using resources. <b>Assessment opportunity:</b> The pupils with teacher assistance begin to structure solutions to problems, for example 'What could we do to get the chair through the door?' (pushing, pulling, lifting).</li> </ul>	<ul style="list-style-type: none"> <li>• <b>talk about ways to solve simple everyday problems;</b> In response to questions, pupils can talk about how an activity might be approached, for example:                             <ul style="list-style-type: none"> <li>– suggest that they use a balance scale to compare the weights of two objects;</li> <li>– talk about different ways they could sort a group of objects, for example by colour, size and texture; and</li> <li>– suggest how to find out if there is enough cutlery for four people.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>enjoy listening to rhymes/stories/songs with an element of counting;</b> The teacher models and shares a variety of counting action rhymes/stories/songs.  <b>Assessment opportunity:</b> The pupils join in counting action rhymes/stories/songs.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>join in counting activities;</b> The teacher models and shares the development of rote counting, including an appreciation of the order of number to at least 10 forwards and backwards and starting at any number. <b>Assessment opportunity:</b> The pupils begin to rote count and understand mathematical language, for example the number after, before and between.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>use counting strategies when carrying out activities;</b> Pupils can use teacher prompts in practical and mental mathematics activities, for example:                             <ul style="list-style-type: none"> <li>– to count on/count back from different starting points, for example count forwards/backwards from 7;</li> <li>– to order numbers within 10, for example know that 6 comes between 5 and 7; and</li> <li>– add and subtract within 10, for example count on when adding 5 and 4.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>explore and describe the variety of designs/textures within their environment;</b> The teacher models and shares the appropriate language to describe objects and materials in their environment, for example a <b>spiky</b> leaf or a <b>smooth</b> shell. <b>Assessment opportunity:</b> The pupils explore a variety of objects and materials and begin to use descriptive language to talk about key features.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>explore simple design/pattern in the environment/mathematics;</b> The teacher models and shares finding simple patterns, for example floor tiles and dice, and how to create repeating patterns using a variety of materials such as pine cones, shells and cubes. <b>Assessment opportunity:</b> The pupils use a variety of materials to make patterns.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>look for and talk about patterns;</b> Through discussion with the teacher, pupils are aware of and can talk about patterns; pupils are prompted to say what comes next and why, for example:                             <ul style="list-style-type: none"> <li>– talk about patterns in their environment, for example bricks, leaves and floor tiles;</li> <li>– copy/continue/create a pattern, for example put out a blue cube, red cube, blue cube and continue the pattern; and</li> <li>– explore patterns in number, for example set out objects in twos.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>react/respond to the information around them;</b> The teacher talks about sources of information, for example personal information: name, birthday, family members, interests, likes and dislikes. <b>Assessment opportunity:</b> The pupils talk about information.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>collect information in everyday contexts;</b> The teacher talks about the reasons for collecting information in everyday contexts, for example 'Why might the cook need to know how many pupils are having dinners?' <b>Assessment opportunity:</b> The pupils understand that information can be collected.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>talk about and collect information required;</b> Pupils can collect identified information. They can interpret the information in response to prompts, for example:                             <ul style="list-style-type: none"> <li>– work as a class to collect information, for example colour of hair, favourite food; and</li> <li>– answer questions about information, for example 'Do more pupils take school dinners than packed lunch?'</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>make representations during play;</b> The teacher talks about the use of a wide variety of materials during play to represent objects and people, for example making models with a variety of materials, role-play and drawing pictures. <b>Assessment opportunity:</b> The pupils talk about their representations, for example a box representing a car.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>know that pictures/symbols can represent real objects and events;</b> The teacher talks about/demonstrates the link between a picture/symbol and its meaning, for example a visual timetable or a set of three to represent that three children may play with the sand. <b>Assessment opportunity:</b> The pupils talk about the link between a picture/symbol and its meaning.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>represent their work using pictures and objects;</b> Pupils can represent identified information in practical activities. They represent their work in 3-D form (blocks, objects) or 2-D form (using stickers or drawings), for example:                             <ul style="list-style-type: none"> <li>– use drawings or pictures to represent and sequence events and special times; and</li> <li>– make a variety of sets for a given number using a range of materials, for example make sets of 8 using large/small objects and know they are equal sets.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>respond to mathematical language.</b> The teacher, when appropriate, encourages the pupils to use the correct mathematical language, for example:                             <ul style="list-style-type: none"> <li>– Pupil: 'A big line of shoes.'</li> <li>– Teacher: 'Yes, it's a long line of shoes.'</li> </ul> <b>Assessment opportunity:</b> The pupils use some mathematical language on occasions.                         </li> </ul>	<ul style="list-style-type: none"> <li>• <b>use early mathematical language modelled by the teacher and show understanding.</b> The teacher models and shares mathematical language through structured activities, for example a sorting box for <b>long</b> and <b>short</b> items.  <b>Assessment opportunity:</b> The pupils use aspects of mathematical language to describe a range of objects.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>use appropriate mathematical language to respond to questions about their work.</b> Pupils can use everyday language, relevant to the mathematical activity, to respond to questions and talk about their work, for example:                             <ul style="list-style-type: none"> <li>– 'How have you sorted your shapes?' 'I put this shape here because it looks the same as the others but it is bigger.'; and</li> <li>– in practical situations, talk about what they are doing or have done using language such as 'bigger than', 'altogether', 'more', 'forwards' and 'empty'.</li> </ul> </li> </ul>

using their **Knowledge and Understanding** of:

<b>Number</b>	<ul style="list-style-type: none"> <li>• count in the context of number rhymes, jingles and stories;</li> <li>• talk about things that they want to spend money on;</li> <li>• investigate and talk about design/pattern in the environment;</li> </ul>	<ul style="list-style-type: none"> <li>• count in the context of number rhymes, jingles and stories;</li> <li>• understand the need to pay for goods;</li> <li>• copy/continue a simple pattern;</li> </ul>	<ul style="list-style-type: none"> <li>• use, estimate, add and subtract numbers up to at least 10;</li> <li>• understand conservation of number;</li> <li>• create and describe repeating patterns using objects, numbers or pictures;</li> <li>• recognise and use coins;</li> </ul>
<b>Measures</b>	<ul style="list-style-type: none"> <li>• use everyday language associated with length, 'weight', capacity and area to describe objects;</li> <li>• talk about activities associated with day and night;</li> <li>• talk about routines during their day, for example lunch time and home time;</li> </ul>	<ul style="list-style-type: none"> <li>• use everyday language associated with length, 'weight', capacity and area to describe and compare two objects;</li> <li>• explore time patterns, for example morning, afternoon, evening and days of the week;</li> </ul>	<ul style="list-style-type: none"> <li>• use everyday language associated with length, 'weight', capacity and area to describe, compare and order three objects;</li> <li>• sequence familiar events;</li> <li>• know the days of the week and their sequence;</li> <li>• recognise 'special' times on the clock;</li> </ul>
<b>Shape and Space</b>	<ul style="list-style-type: none"> <li>• explore and talk about shapes in the environment;</li> <li>• explore movement through space during indoor and outdoor play activities;</li> </ul>	<ul style="list-style-type: none"> <li>• build, make and talk about models with 3-D shapes;</li> <li>• understand and use a range of positional words;</li> </ul>	<ul style="list-style-type: none"> <li>• sort 2-D and 3-D shapes and make and describe 2-D and 3-D constructions;</li> <li>• use language and follow instructions, in practical situations, for position and movement;</li> </ul>
<b>Handling Data</b>	<ul style="list-style-type: none"> <li>• explore freely properties of a range of materials.</li> </ul>	<ul style="list-style-type: none"> <li>• sort collections of random materials.</li> </ul>	<ul style="list-style-type: none"> <li>• sort and classify real objects for one criterion and re-sort for a different criterion, using Venn, Carroll and Tree diagrams;</li> <li>• collect information and record using real objects or drawings.<sup>2</sup></li> </ul>

<sup>1</sup>Across the curriculum, at a level appropriate to their ability, pupils should also be enabled to develop financial capability and use ICT to solve problems and/or present their work.

<sup>2</sup>Please refer to Expansion of the Levels of Progression in Using Mathematics across the Curriculum, available at [www.nicurriculum.org.uk](http://www.nicurriculum.org.uk), for full details relating to Knowledge and Understanding.