



## Progression of Skills: Addition and Subtraction

Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<p><b>Addition and subtraction</b></p> <p><b>Pupils should be taught to:</b></p> <p>Compare two groups of objects, saying when they have the same number.</p> <p>Show an interest in number problems</p> <p>Separate a group of three or four objects in different ways, beginning to recognise that the total is still the same.</p>	<p><b>Addition and subtraction</b></p> <p><b>Pupils should be taught to:</b></p> <p>Use the language of 'more' and 'fewer' to compare two sets of objects and find the total number of items in two groups by counting all of them.</p> <p>Find one more or one less from a group of up to five objects, then ten objects.</p> <p>Automatically recall number bonds for number 0-10</p> <p>In practical activities and discussion, begin to use the vocabulary involved in adding and subtracting.</p> <p>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</p> <p>Record, using marks that they can interpret and explain.</p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Represent and use number bonds and related subtraction facts within 20</p> <p>Add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> <li>- using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>- applying their increasing knowledge of mental and written methods</li> </ul> <p>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> <li>- a two-digit number and ones</li> <li>- a two-digit number and tens</li> <li>- two two-digit numbers</li> <li>- adding three one-digit numbers</li> </ul> <p>Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another</p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> <li>- a three-digit number and ones</li> <li>- a three-digit number and tens</li> <li>- a three-digit number and hundreds</li> </ul> <p>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p> <p>Estimate the answer to a calculation and use inverse operations to check answers</p> <p>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> <p>Estimate and use inverse operations to check answers to a calculation</p> <p>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> <p>Add and subtract numbers mentally with increasingly large numbers</p> <p>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>	<p><b>Addition and subtraction</b></p> <p>Pupils should be taught to:</p> <p>Perform mental calculations, including with mixed operations and large numbers</p> <p>Use their knowledge of the order of operations to carry out calculations involving the four operations</p> <p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> <p>Solve problems involving addition and subtraction, use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy</p>

	<p><b>ELG</b> Automatically recall number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</p> <p>Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</p>		<p>cannot</p> <p>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems</p>				
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## **Removing barriers to the primary mathematics curriculum for pupils with SEN and/or disabilities**

### **Maintaining an inclusive learning environment**

- Interactive whiteboards are non-reflective to reduce glare.
- Seating should allow all pupils in the class to communicate, respond and interact with each other and the teacher in discussions.
- Avoid the need for copying lots of information. For example, notes on interactive whiteboards can be printed off for all pupils.
- Use systems such as racks so that maths equipment can be checked out and checked back in.
- Some pupils may need modified maths equipment. In particular, some may need access to tactile and other specialist equipment for work relating to shape, space and measures, to overcome difficulties in managing visual information.

### **Multi-sensory approaches, including ICT**

- Find out how pupils prefer to learn mathematics. There is no reason why the term 'learning style' should be restricted to the well-known visual, auditory and kinaesthetic styles. Many pupils, for instance, particularly value learning through ICT of one kind or another.
- Build on pupils' preferred learning styles when explaining mathematical concepts, by exploiting different media – eg stories, acting out processes, models, computer simulations, animations, concept mapping etc. There should be "something to see, something to listen to and something to do at each stage of mathematical development" (El-Naggar, 1996).
- Explore concepts in different forms – eg as a word-sentence, sequence of body language, picture, graph or equation. Puppets, mascots and objects add fun and elements of surprise to lessons, and action songs, games and rhymes encourage a physical response.
- Use concrete or visual support for mathematical discussions whenever possible.
- Exploit the many forms of mathematical representation – eg pie charts, number lines, abacus, bar charts, tiles – and the connections between them. ICT can enable pupils to switch quickly between different representations.

**In mathematics, ICT can allow pupils to:**

- react quickly to opportunities "for mathematical thought in their environment – eg taking photographs of patterns on a wall with a digital camera and analysing them on the computer

### **Working with additional adults**

Plan, where appropriate, for:

- pupils to be pre-tutored in "important mathematical vocabulary, concepts and/or processes
- ‘scaffolding’ when pupils use "equipment, especially for tasks requiring accuracy or skill (eg drawing or measurement), and
- help for pupils – eg pupils with "a hearing impairment – to interpret or respond to oral aspects of mathematics lessons such as mental mathematics.
- Prepare resources – eg pre-prepared grids for recording information can be helpful for some pupils.
- Tightly targeted mathematics interventions for individual pupils can be highly effective, even if they only take a short time each week

### **Adult Pupil communication**

- Recognise that the language of mathematics may be challenging for many pupils. For example: the specific mathematical use "of everyday words such as ‘tables’, ‘translate’, ‘right angle’
- terms specific to mathematics "– eg ‘digit’, ‘subtract’ terms such as ‘height’, ‘distance’ "or ‘mass’ can create barriers for some pupils, because of their abstract nature.
- Plan to teach new vocabulary explicitly and make sure that pre-tutoring on mathematical vocabulary is available for pupils who need it.
- Give pupils with communication impairments time to answer open-ended questions.
- Use discussion of mathematical investigations to inform pupils’ development of mathematical language and help them to analyse and understand what they have seen.
- In a plenary after the class has completed a task, allow pupils time to discuss the answers to questions in pairs, before asking for verbal responses.

### **Assessment for Learning**

- Lesson objectives are made clear in pictures/symbols/writing, as appropriate.
- Objectives are challenging yet achievable. This will promote self-esteem and enable all pupils to achieve success.
- Pupils’ own ways of learning and remembering things are emphasised.
- Pupils are encouraged to talk about how they achieved something. Dialogue is the key to successful assessment for learning. Teachers communicate in ways pupils are comfortable with.
- Pupils are encouraged to look back to previous work/photos/records to see how much progress they have made.
- Give feedback in terms of the information that will help pupils improve their performance.
- Emphasis is on the pupils’ progress and achievement. Weaknesses are presented as areas for development. Opportunities are offered for pupils to attempt a piece of work again. These approaches are particularly useful for pupils who find it difficult to receive comments about improving their work.
- Assessment looks at what pupils know and can do, not at labels associated with SEN and/or disabilities.
- Notes made about individual pupils’ difficulties/successes in the lesson take account of their oral contributions as well as their written work.

### **Memory / Consolidation**

- The amount of material to be remembered is reduced. Repeat or display important information.

- The meaningfulness and familiarity of the material is increased.
- Mental processing and explanations of complex tasks are simplified.
- The use of memory aids is encouraged. These can include working wall, cubes, counters, abacus, Unifix blocks, number lines, multiplication grids, calculators, memory cards.
- Activities are structured so that pupils can use available resources, such as manipulatives
- New learning fits into the framework of what the pupil already knows.
- Teaching assistants prepare pupils to contribute to feedback sessions, where appropriate.
- Using visual or concrete ('real') materials, or activities involving movement, to reinforce or consolidate learning through a range of sensory channels.
- Encourage pupils to develop their own strategies, eg an agreed approach to asking for help, rehearsal, note-taking, use of long-term memory, and place-keeping and organisational strategies.