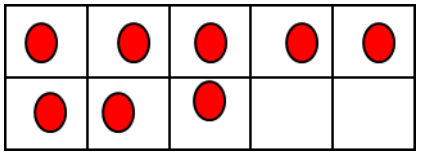
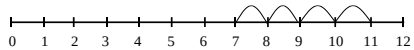
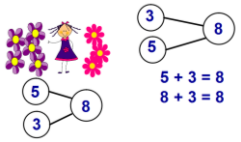
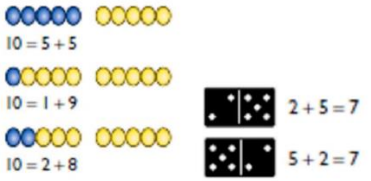
# Addition

Calculation progression through the primary years

*‘Nobody else is quite like me’*

| | Branches | Milestone 1<br>Year 1 National Curriculum | Method | Model/Examples |
|---|---|---|---|---|
| Addition Year 1 | **Number Bonds** | represent and use number bonds and related subtraction facts within 20 | **<u>+ = signs and missing numbers</u>**<br>Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.<br>2 = 1+ 1<br>2 + 3 = 4 + 1<br><br>Missing numbers need to be placed in all possible places.<br>3 + 4 = □ □ = 3 + 4<br>3 + □ = 7 7 = □ + 4<br><br>**<u>Counting and Combining sets of Objects</u>**<br>Combining two sets of objects (aggregation) which will progress onto adding on to a set (augmentation) | Combining two sets of objects<br>  <br><br><br>Use tens frame and numicon to support children to visualise number facts<br>  <br>Understanding of counting on with a number track.<br>  <br><br>Understanding of counting on with a number line (supported by models and images).<br>7+ 4<br>  <br><br>  <br><br>Use the part, whole model to represent the addition.<br>  <br> |
| | **Mental Calculations** | add and subtract one-digit and two-digit numbers to 20, including zero | | |
| | | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) | | |
| | **Written Methods** | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) | | |
| | **Inverse operations, estimating and checking answers** | | | |
| | **Problem Solving** | solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9 | | |

# Subtraction

Calculation progression through the primary years

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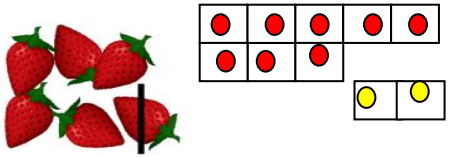
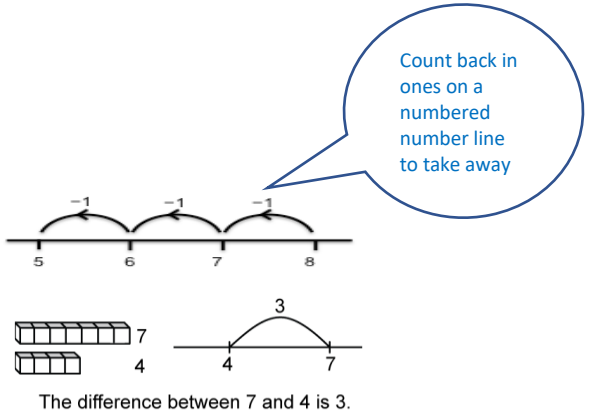
| | Branches | Milestone 1<br>Year 1 National Curriculum | Method | Model/Examples |
|---|---|---|---|---|
| Subtraction Year 1 | **Number Bonds** | represent and use number bonds and related subtraction facts within 20 | **Missing number problems**<br>As well as recalling subtraction facts up to 20, children should be able to subtract zero. | Use – = signs and missing numbers<br>○ = 8 – 3 8 – 3 = Δ<br>5 = □ – 3 8 – ○ = 5<br>5 = 8 – Δ □ – 3 = 5<br>5 = ○ – □ □ – ○ = 5 |
| | **Mental Calculations** | add and subtract one-digit and two-digit numbers to 20, including zero | **Understand subtraction as take-away**<br>The use of images is valuable for modelling subtraction e.g. Numicon, bundles of straws, apparatus, multi-link cubes, part whole, tens frames |  |
| | | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) | Use concrete objects and pictorial representations. If appropriate, progress from using number lines with every number shown, to number lines with significant numbers shown. |  <br>The difference between 7 and 4 is 3. |
| | **Written Methods** | read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) | | |
| | **Inverse operations, estimating and checking answers** | | **Understand subtraction as finding the difference.**<br>This will be introduced practically with language 'find the difference' and 'how many more' in a range of familiar contexts. | |
| | **Problem Solving** | solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9 | | |

# Multiplication

Calculation progression through the primary years

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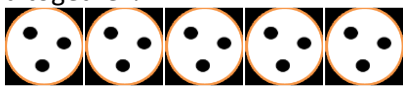
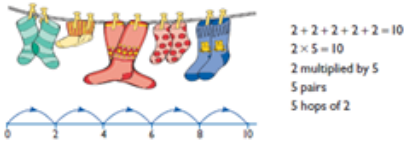
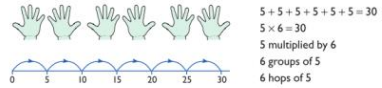
| | Branches | Milestone 1<br>Year 1 | Method | Models/Examples |
|---|---|---|---|---|
| Multiplication Year 1 | **Multiplication and division facts** | count in multiples of twos, fives and tens (copied from Number and Place Value | Understand multiplication is related to doubling and combining groups of the same size (repeated addition)<br><br>Washing line, and other practical resources for counting. Concrete objects. Numicon; bundles of straws, bead strings<br><br>Problem solving with concrete objects (including money and measures<br><br>Use cuissenaire and numicon to develop the vocabulary relating to 'times' or 'lots of'.<br><br>Use arrays to understand multiplication can be done in any order (commutative) | How many legs will 3 teddies have?<br>  <br>2 + 2 + 2 = 6<br><br>There are 3 sweets in one bag.<br>How many sweets are in 5 bags altogether?<br>  <br>3 + 3 + 3 + 3 + 3 = 15<br><br>Give children experience of counting in 2s, 5s and 10s<br>  <br><br>  <br><br>  <br>2 x 3 = 6 or 3 x 2 = 6<br><br>  |
| | **Mental Calculations** | | | |
| | **Written Methods** | | | |
| | **Properties of numbers: Multiples, Factors, Prime, Square, cube numbers** | | | |
| | **Order of Operations** | | | |
| | **Inverse operations, estimating and checking answers** | | | |
| | **Problem Solving** | solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | | |

# Division

Calculation progression through the primary years

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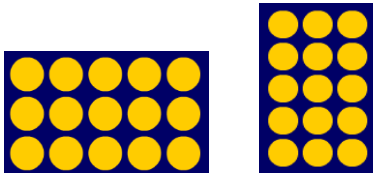
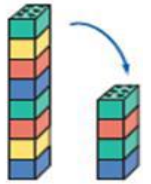
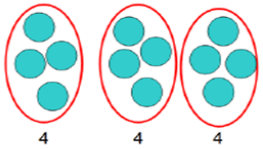
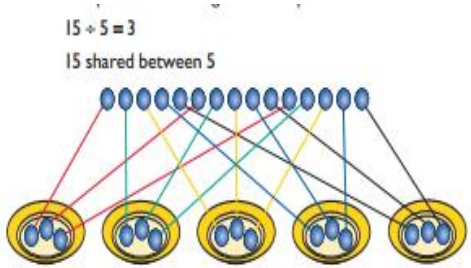
| | Branches | Milestone 1<br>Year 1 | Method | Models/Examples |
|---|---|---|---|---|
| Division Year 1 | **Multiplication and division facts** | count in multiples of twos, fives and tens (copied from Number and Place Value | Children must have secure counting skills- being able to confidently count in 2s, 5s and 10s.<br>Children should be given opportunities to reason about what they notice in number patterns.<br><br>Group AND share small quantities- understanding the difference between the two concepts.<br><br>**<u>Grouping</u>**<br>Children should apply their counting skills to develop some understanding of grouping.<br>Use of arrays as a pictorial representation for division. 12 ÷ 3 = 4 There are 3 groups of 4.<br>12 ÷ 4 = 3 There are 4 groups of 3.<br>Children should be able to find ½ and ¼ and simple fractions of objects, numbers and quantities.<br>**<u>Sharing</u>**<br>Develops importance of one-to-one correspondence.<br>Children should be taught to share using concrete apparatus. | How many groups of 4 can be made with 12 stars? = **3**<br>  <br>  <br>15 ÷ 3 = 5 There are 5 groups of 3. 15 ÷ 5 = 3 There are 3 groups of 5<br>  <br>half of 8 is 4<br>8 ÷ 2 = 4<br>  <br>4 4 4<br>12 shared between 3 is 4<br>  <br>15 ÷ 5 = 3<br>15 shared between 5 |
| | **Mental Calculations** | | | |
| | **Written Methods** | | | |
| | **Properties of numbers: Multiples, Factors, Prime, Square, cube numbers** | | | |
| | **Order of Operations** | | | |
| | **Inverse operations, estimating and checking answers** | | | |
| | **Problem Solving** | solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | | |