
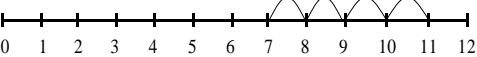
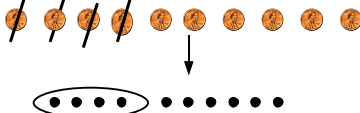


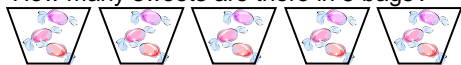
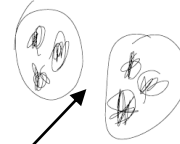


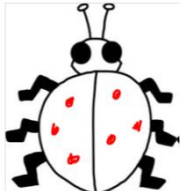


## Calculation Policy Guidance

### Stage 1

Addition	Subtraction	Multiplication	Division
<p><b><u>Role play/Pictures and marks</u></b> Children should experience practical calculation opportunities using a wide variety of practical equipment, including small world play, role play, counters, cubes and Numicon etc.</p> <p><b><u>Visual methods and recording</u></b></p>  <p style="text-align: center;">4+6    5+5    6+4</p> <p>Children begin to use concrete objects and pictorial representations to solve problems. When ready children should be encouraged to record number sentences.</p> <p><b><u>Number lines (numbered)</u></b> Begin with Number tracks developing to use Number lines. Children encouraged to build own number lines to first develop understanding.</p> <p style="text-align: center;">7 + 4</p>  <p>Recording by</p> <ul style="list-style-type: none"> <li>- drawing jumps on prepared lines</li> <li>- constructing own lines</li> </ul> <p>(Teachers model number lines with missing numbers)</p>	<p><b><u>Role play/Pictures and marks</u></b> Children should experience practical calculation opportunities using a wide variety of equipment, e.g. small world play, role play, counters, cubes and Numicon etc. Numicon to be used to cover and find the difference. They develop ways of recording calculations using pictures, etc.</p> <p><b><u>Visual methods and recording</u></b> When solving problems visually, the amount being taken away are show crossed out. Children would be encouraged to physically remove these using touch counting E.g. Sam had 10 cookies. He eats 4, how many does he have left?</p>  <p>Children use a range of concrete objects and pictorial representations to help solve problems. When the children are ready record their working out using number sentences.</p> <p><b><u>Number lines (numbered)</u></b></p> <p style="text-align: center;">11 – 7 (Counting back)</p>  <p>Recording by - drawing jumps on prepared lines - constructing own lines</p> <p><b><u>Finding the Difference</u></b> Children use objects including Numicon to compare and calculate differences between quantities.</p>	<p><b><u>Role play/Pictures and marks</u></b> Children will experience equal groups of objects and will count in 2s and 10s and begin to count in 5s. They will work on practical problem solving activities involving equal sets or groups. They will explore this through learning opportunities such as role play and play dough activities.</p>  <p><b><u>Visual methods and recording</u></b> Children will begin solving a range of problems using concrete objects and pictorial representations. They begin to record using pictures. There are 3 sweets in one bag. How many sweets are there in 5 bags?</p>  <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>A child's jotting showing double three as three cookies on each plate.</p>  </div> <p><b><u>Arrays</u></b> Children encouraged to solve problems using arrays and by building them with concrete objects.</p>	<p><b><u>Role play/Pictures and marks</u></b> Children investigate sharing and putting items into groups using items such as egg boxes, ice cube trays and baking tins</p> <p>They experience practical calculation opportunities using a wide variety of equipment such as role play, small world play, counters and cubes.</p>  <p><b><u>Visual methods and recording</u></b> Children solve problems using concrete objects and pictorial representations. They build up to recording their workings using pictures.</p> <p>12 children get into teams of 4 to play a game. How many teams are there?</p>  <p>Having six spots between two sides of a ladybird.</p> 





**Calculation Policy Guidance**

**Stage 4**

Addition	Subtraction	Multiplication	Division
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## Calculation Policy Guidance

### Columnar Addition

Continue to develop column addition as Stage 3. From this, children will begin to carry below the line.

$$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array} \quad \begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$$

Children should extend the carrying method to numbers with at least four digits.

$$\begin{array}{r} 587 \\ + 475 \\ \hline 1062 \\ 11 \end{array} \quad \begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ 111 \end{array}$$

Children should also be able to add numbers to include one decimal place.

$$\begin{array}{r} 72.8 \\ +54.6 \\ \hline 127.4 \\ 11 \end{array}$$

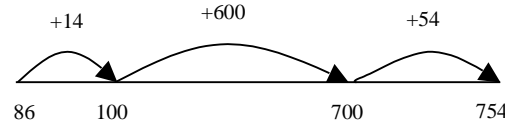
(Revert to expanded methods if the children experience any difficulty.)

### Finding the difference

Continue as in stage 3 and support children to use knowledge of number facts to find a difference more efficiently.

### Subtraction using a number line

Continue as in Stage 3 but with larger numbers



### Columnar subtraction

Continue as in stage 3 and develop to use larger numbers, building to using 4 digits. Children first given opportunities to solve simple subtraction problems and then develop to larger numbers where they exchange through carrying.

<p>874 – 523 becomes</p> $\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$ <p>Answer: 351</p>	<p>932 – 457 becomes</p> $\begin{array}{r} 8 \quad 12 \quad 1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$ <p>Answer: 475</p>
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### Partitioning

Continue to use partitioning methods to support mental calculations.

$$23 \times 4 = 92$$

$$\begin{aligned} 23 \times 4 &= (20 \times 4) + (3 \times 4) \\ &= (80) + (12) \\ &= 92 \end{aligned}$$

### Grid method

Continue to use the grid method as in stage 3 and extend to larger numbers until secure.

### Short Multiplication

Children first give opportunities to use small numbers multiplying by simple times tables for which they are secure.

24 x 6 becomes

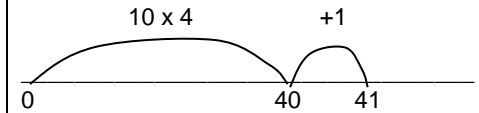
$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}$$

Extend to multiplying 3 digit numbers.

### Chunking using a number line

Continue to use a number line as in stage 3 to develop understanding of grouping. Continue to more efficient methods as shown below.

$$41 \div 4 = 10 \text{ r}1$$



### Chunking using Long division

When ready children extended to use formal methods of division. Begin with simple numbers using times tables of which they are secure, initially without remainders.

	14	Children should write their answer above the calculation at the end.
4 ) 56	- 40	
	16	
	- 16	
	0	
	Answer: 14	

Progress to two digit by one digit **including remainders** and then dividing 3 digit numbers.

## Calculation Policy Guidance

### Stage 5

Addition	Subtraction	Multiplication	Division
<p><b>Columnar Addition</b> Children should continue to use the carrying method to solve calculations such as:</p> $\begin{array}{r} 3 \ 3 \ 6 \ 4 \\ + \ 2 \ 4 \ 7 \\ \hline 3 \ 6 \ 1 \ 1 \\ \hline 1 \ 1 \end{array}$ <p>Adding 3 numbers with varying amounts of digits.</p> $\begin{array}{r} 3 \ 1 \ 2 \ 1 \\ + \ \ \ 3 \ 7 \\ \hline 3 \ 3 \ 0 \ 6 \\ \hline 1 \ 1 \end{array}$ <p>Adding decimals to 2 decimal places.</p> $\begin{array}{r} 3 \ . \ 5 \ 6 \\ + \ 2 \ . \ 4 \ 7 \\ \hline 6 \ . \ 0 \ 3 \\ \hline 1 \end{array}$ <p>Extend to using decimals in the context of money (vertically)</p> $\begin{array}{r} \pounds 2.50 \\ + \pounds 1.75 \\ \hline \pounds 4.25 \\ 1 \end{array}$ <p>Revert to expanded methods if the children experience any difficulty.</p> <p>Model negative numbers using a number line.</p>	<p><b>Finding a difference</b> Find a difference by counting up e.g. <math>8006 - 2993 = 5013</math> This can be modelled on an empty number line as in stage 3 but with larger numbers.</p> <p><b>Columnar subtraction</b> Children should continue to use the decomposition method to solve calculations such as:</p> $\begin{array}{r} \overset{6}{\cancel{7}} \ 0 \ \overset{6}{\cancel{7}} \ 2 \\ - \ 3 \ 2 \ 2 \ 6 \\ \hline 3 \ 8 \ 4 \ 6 \end{array} \quad \begin{array}{r} \overset{2}{\cancel{3}} \ . \ \overset{13}{\cancel{4}} \ 2 \\ - \ 1 \ . \ 7 \ 6 \\ \hline 1 \ . \ 6 \ 6 \end{array}$ <p>They will also be subtracting:</p> <ul style="list-style-type: none"> <li>• numbers with different numbers of digits, understanding the place value;</li> <li>• amounts of money and measures, including those where they have to initially convert from one unit to another</li> </ul>	<p><b>Partitioning</b> Continue to partition for mental methods and extend to larger numbers and in a range of contexts.</p> $47 \times 6 = 92$ $47 \times 6 = (40 \times 6) + (7 \times 6) = (240) + (42) = 282$ <p><b>Short Multiplication</b> Continue as in Stage 4 extending to multiplying 4 digit numbers.</p> <p>Extend to simple decimals with one decimal place.</p> $\begin{array}{r} 12.5 \\ \times 2 \\ \hline 1.0 \ (2.0 \times 0.5) \\ 4.0 \ (2.0 \times 2.0) \\ \hline 20.0 \ (2.0 \times 10.0) \\ 25.0 \end{array}$ <p><b>Long Multiplication</b> Introduce long multiplication beginning to multiply by 2 digit numbers.</p> $24 \times 16 \text{ becomes } \begin{array}{r} \phantom{2} \\ 2 \ 4 \\ \times 1 \ 6 \\ \hline 2 \ 4 \ 0 \\ 1 \ 4 \ 4 \\ \hline 3 \ 8 \ 4 \end{array}$	<p><b>Short division by chunking</b> Continue as in stage 4 and extend with larger numbers.</p> <p><b>Short Division</b> When children are secure with short division through chunking, introduce compact short division as a more efficient method. Explain that they may need to revert to chunking for some questions. Remainders should be shown by integers.</p> <p><math>98 \div 7</math> becomes <math>43 \text{ r } 2</math>      <math>432 \div 5</math> becomes <math>86 \text{ r } 2</math></p> $\begin{array}{r} 1 \ 4 \\ 7 \overline{) 9 \ 8} \\ \underline{7 \ 8} \phantom{0} \\ 2 \phantom{0} \end{array} \quad \begin{array}{r} 8 \ 6 \ \text{r } 2 \\ 5 \overline{) 4 \ 3 \ 2} \\ \underline{4 \ 3} \phantom{0} \\ 2 \phantom{0} \end{array}$ <p>Answer: 14      Answer: 86 remainder 2</p> <p><b>Long Division</b> To develop the chunking method further, long division should be extended so they can divide 4 digits by a single digit number. Remainders should still be represented by integers.</p> $2458 \div 7$ $\begin{array}{r} 351 \text{ r } 1 \\ 7 \overline{) 2458} \\ \underline{- 2100} \phantom{0} \quad \text{300x} \\ 358 \\ \underline{- 350} \phantom{0} \quad \text{50x} \\ 8 \\ \underline{- 7} \phantom{0} \quad \text{1x} \\ 1 \end{array}$

