
# Maths Calculation Policy

The following Calculation Policy has been largely adapted from the *White Rose Maths Hub* Calculation Policy, with additional material from *Power Maths*, and meets requirements of the National Curriculum 2014 for the teaching and learning of mathematics, in accordance with an increased emphasis on fluency and mastery of concepts. It is designed to provide pupils with a clear and smooth progression of learning through KS1 and KS2 and ensure that the teaching of calculation methods remains consistent across the 4 operations of addition, subtraction, multiplication and division. The consistent use of the CPA (concrete, pictorial, abstract) approach helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods. The school calculation policy builds progressively from the content and methods established in EYFS, with a recognition that concrete and pictorial representations of problems continue to play a valuable role throughout all key stages.

## Age-stage expectations

The calculation policy is organised according to age-stage expectations as set out in the National Curriculum (2014); however, we recognise that pupils need to be taught at an appropriate level 'based on the security of pupil's understanding and their readiness to progress to the next stage' (National Curriculum ). This 'readiness to progress' is a clear focus at this challenging time and there will be a clear emphasis on recapping and reviewing methods from previous years where needed.

## Context for calculation

It is crucial that children are given real-life contexts and problems in which to use and apply their calculation methods. Children subsequently develop a more secure understanding of the purpose of calculations and learn to choose their operations with accuracy. This is a priority in an increasingly-challenging curriculum, with its focus on mastery.

## Choosing a calculation method

Children must be taught and encouraged to use a simple process in deciding what approach to take to a calculation, ensuring that they select the most appropriate method for the problem, whether mental or written. Children need to be comfortable with a wide variety of strategies and representations in order to demonstrate this.

## KEY STAGE 1

Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.

**Key language:** whole, part, ones, ten, tens, number bond, add, addition, plus, total, sum, altogether, subtract, subtraction, find the difference, take away, minus, less, fewer, more, group, share, equal, equals, is equal to, is the same as, groups, equal groups, double, times, multiply, multiplied by, divide, divided by, share, group, shared equally, half, times-table

## KEY STAGE 2

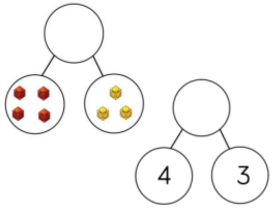
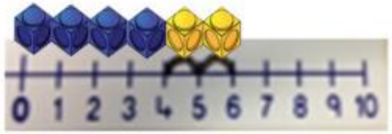
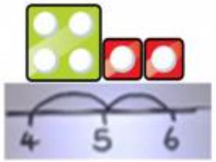
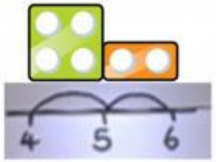
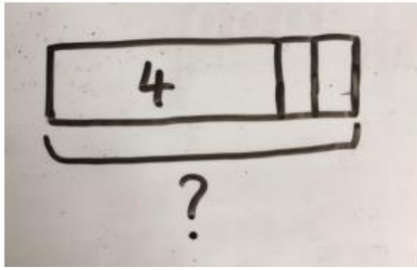
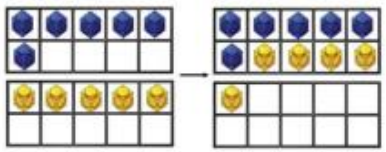
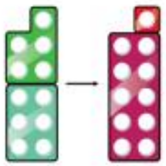
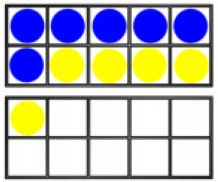
In Years 3 and 4, children develop the basis of written methods by building their skills alongside a deep understanding of place value. They should use known addition/subtraction and multiplication/division facts to calculate efficiently and accurately, rather than relying on counting. Children use place value equipment to support their understanding, but not as a substitute for thinking.

**Key language:** partition, place value, tens, hundreds, thousands, column method, whole, part, decrease, equal groups, the product of, sharing, grouping, bar model

In upper Key Stage 2, children build on secure foundations in calculation, and develop fluency, accuracy and flexibility in their approach to the four operations. They work with whole numbers and adapt their skills to work with decimals, and they continue to develop their ability to select appropriate, accurate and efficient operations.

**Key language:** decimal, column methods, exchange, partition, mental method, ten thousand, hundred thousand, million, factor, multiple, prime number, square number, cube number

Accurate use of mathematical language demonstrates understanding of concepts and children will be introduced to key words and concepts as appropriate. This is taken from *Power Maths*.

| EYFS / Year 1 Addition | | | |
|---|---|---|---|
| **Objective and Strategy** | **Concrete** | **Pictorial** | **Abstract** |
| **Combining two parts to make a whole**: understanding the part-whole model<br><br>*Adding two 1-digit numbers to 10* |  <br><br>Use part-part-whole model; use cubes to add two numbers together, as a group or in a bar. Other resources can be used: teddy bears, shells, people, toy cars!<br><br>*The parts are 4 and 3. The whole is 7.* | <br><br>Children draw to represent the parts and understand the relationship with the whole.<br><br>*The parts are 4 and 3. The whole is 7.* | 4 + 3 = 7<br><br>*4 is a part, 3 is a part and the whole is 7.* |
| Starting at the bigger number and **counting on** using number lines (using cubes or Numicon to help) | <br> <br><br>Start with the larger number and count on one by one. Bead strings can also be used. | <br><br>A bar model to encourage children to count on rather than count all.<br><br>Children may also draw a number line and count on in ones or in one jump. | 4 + 2 = 6<br><br>Children place the larger number in their head and count on the smaller number to find the answer.<br><br>They may also think of the number line as an abstract idea – what is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? |
| **Regrouping to make 10**, using ten frames, counters, cubes and Numicon | 6 + 5<br>  |  | 6 + 5 = 11<br><br>Children start to understand the idea of equality:<br><br>6 + $\boxed{\phantom{0}}$ = 11 |

| | | | |
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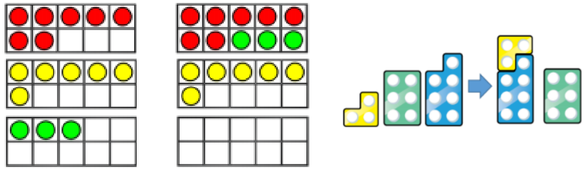
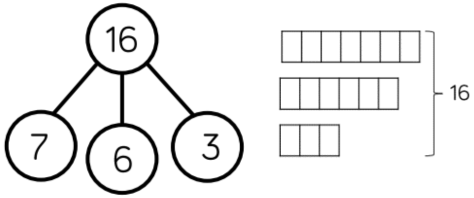
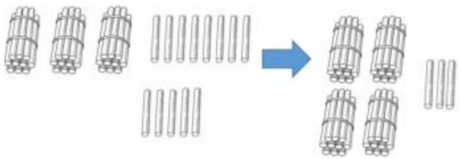
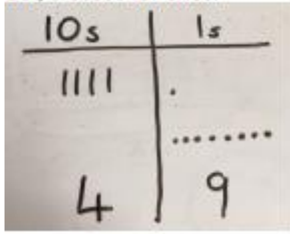
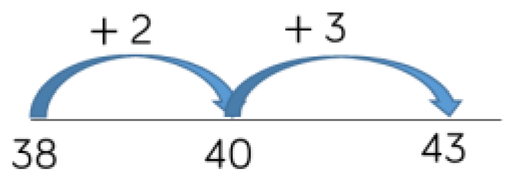
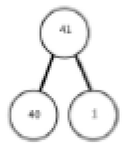
| *Adding 1 and 2-digit numbers to 20* | | Children draw the ten frame and counters / cubes. They may also partition the smaller number using the part-part-whole model to make 10 | $6 + 5 = 5 + \boxed{\phantom{0}}$<br>$6 + 5 = \boxed{\phantom{0}} + 4$ |
| Year 2 Addition | | | |
| Adding three 1-digit numbers | <br>Children should look for number bonds to 10, or doubles, to add more efficiently. | <br>Children may draw a part-whole model or bar models to help. | $\boxed{7 + 6 + 3 = 16}$<br>$\underbrace{7 + 6 + 3}_{10} = 16$ |
| Adding a 2-digit number and ones<br>• not crossing 10<br>• crossing 10 | TO + O using base 10. Continue to develop understanding of partitioning and place value.<br>41 + 8<br><br>Practical apparatus used to find the number bond to 10<br> | Children to represent the base 10 e.g. lines for tens and dot/crosses for ones.<br><br>Children encouraged to count on from the larger<br><br>number, crossing 10 | 41 + 8<br><br>1 + 8 = 9<br>40 + 9 = 49<br>$\begin{array}{r} 41 \\ +\ \ 8 \\ \hline 49 \end{array}$<br>Children can also use their number bonds to 10 to help:<br>$\boxed{38 + 5 = 43}$<br>8 + 5 = 13, so 38 + 5 = 43 |

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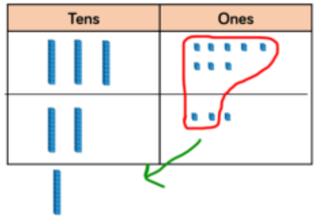
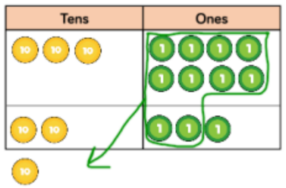
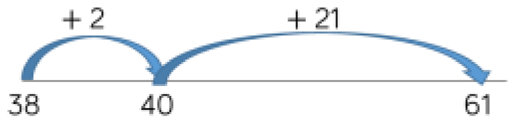
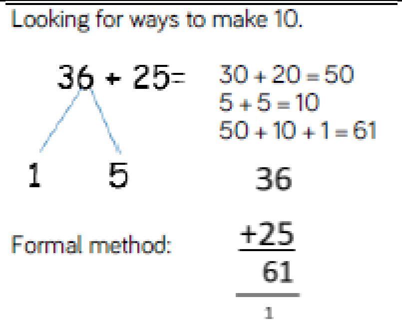
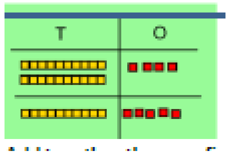
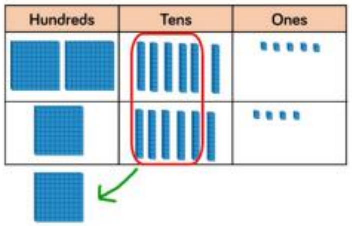
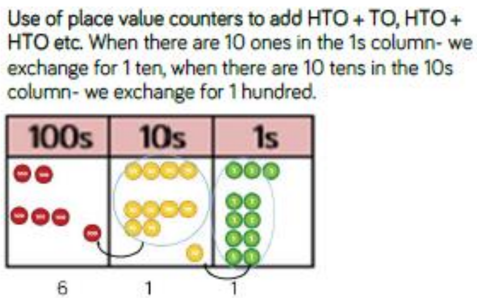
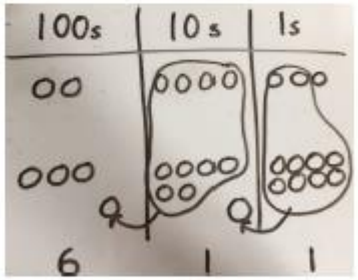
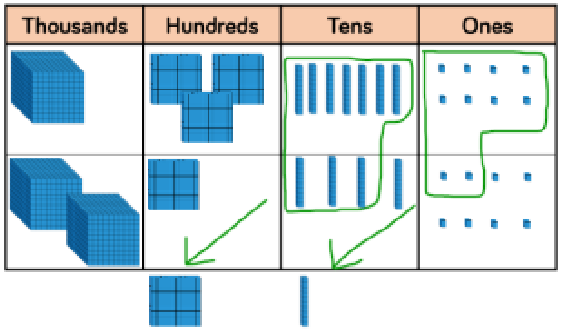
| Adding two 2-digit numbers<br>• not crossing 10<br>• crossing 10 | Children begin by adding 2-digit numbers with no exchange, using practical manipulatives to consolidate undertanding alongside formal written methods (column addition). They then explore exchange<br><br> | Children can represent Base 10 or place value counters in a place value chart (see left) or continue to use number lines, jumping to multiples of 10 to be more efficient<br> | <br>Children use the practical methods to show understanding in a column method – exchanging 10 ones for 1 ten<br>38<br>+ 23<br>61<br>1 |

| Years 3 – 6 Addition | | | |
|---|---|---|---|
| Adding numbers with up to 3 digits – no exchange<br><br>Year 3 | Use Base 10 to solve practically, adding the ones first then the tens<br><br>Place value counters and grids will also be used (see below) with no regrouping (exchange) | Children may draw counters using a place value grid | They will use a written column method, adding the ones first, then the tens, then the hundreds<br>$$\begin{array}{r} 2\ 2\ 3 \\ +\ 1\ 1\ 4 \\ \hline 3\ 3\ 7 \end{array}$$ |
| Adding numbers with up to 3 digits – with exchange<br><br>Year 3<br><br>*We will start with exchange into 1 column, before moving onto exchanges in more than 1 column* | We will use Base 10<br><br>265 + 164<br><br> | Children can represent the counters in a place value chart, showing where they need to exchange:<br> | Column method used: start with the ones first, then the tens, then the hundreds<br>$$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline {\scriptstyle 1\ 1\ } \end{array}$$ |

<table>
<tr>
<td>Adding numbers with up to 4 digits<br><br>Year 4</td>
<td>Children will continue to use practical methods to add larger numbers – place value grids or Base 10. They will exchange 10 ones for a ten, 10 tens for a hundred and 10 hundreds for a thousand<br><br>
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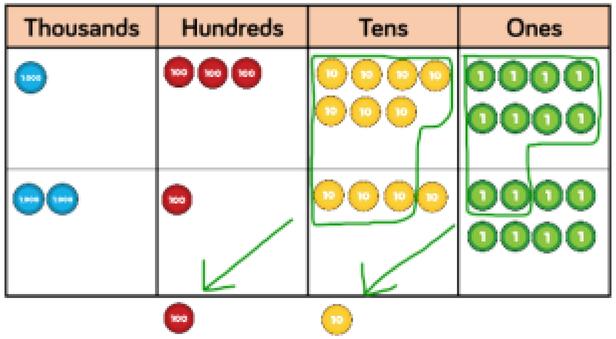
<td>Children can represent addition in a place value grid, using coloured circles to show the exchanges<br><br>
</td>
<td>Children continue to use a formal written method of column addition<br><br>1 3 7 8<br>+ 2 1 4 8<br>3 5 2 6<br>1 1</td>
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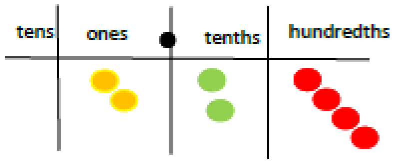
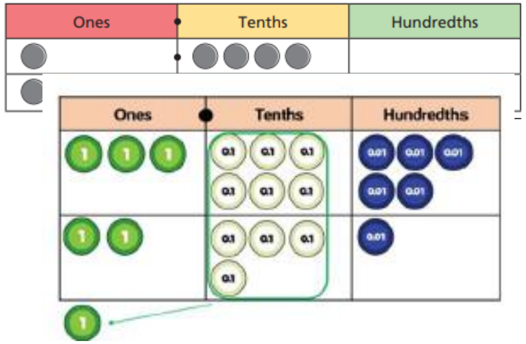
<tr>
<td>Adding numbers with more than 4 digits<br><br>Year 5<br><br>Adding decimals, including money (3 decimal places)</td>
<td>Children use place value grids or Base 10 to consolidate understanding, using larger numbers<br><br>Decimal place value counters introduced to help with exchange<br><br>
</td>
<td>Children may draw representations on a place value grid<br><br>
</td>
<td>Children use column methods accurately (relate decimals to money and measures)<br><br>£ 2 3 . 5 9<br>+ £ 7 . 5 5<br>£ 3 1 . 1 4</td>
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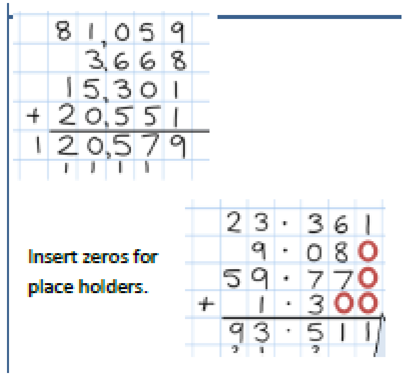
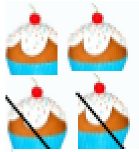
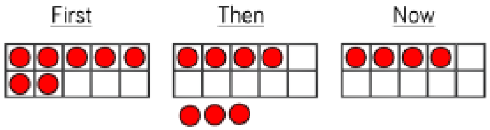
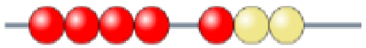
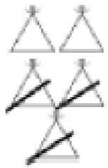
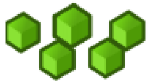
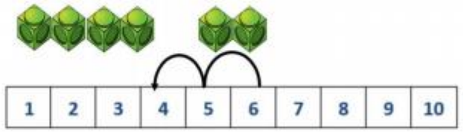
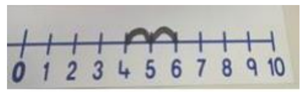
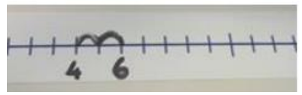
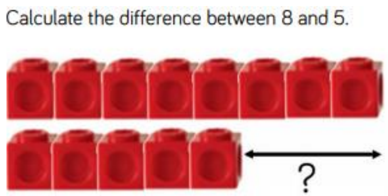
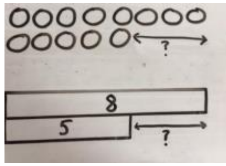
|---|---|---|---|
| Adding several numbers of increasing complexity<br><br>Year 6<br><br>Adding money and measures with different numbers of decimal places | As Year 5, using place value counters to add decimals | As Year 5 |  |

| EYFS / Year 1 Subtraction | | | |
|---|---|---|---|
| **Objective and Strategy** | **Concrete** | **Pictorial** | **Abstract** |
| **Taking away ones** (starting within 10 and moving onto 20) | Use practical apparatus (counters, cubes, toys) to show how objects can be taken away<br> 4 – 2 = 2<br><br> | Crossing out drawn objects to show what has been taken away<br> 5 – 3 = 2 | 7 – 4 = 3<br><br>9 – 5 = 4 |
| **Counting back** | Move objects away from the group, counting backwards  <br><br>Moving beads along the string, counting backwards  | Count back in ones using a number line or a number track<br>6 – 2 = 4<br> | Put 6 in your head and count back 2. What number are you at? Children can represent this on an empty<br><br><br>number line if needed |
| **Finding the difference** | Compare physical objects and quantities (display them carefully so they represent a bar model)<br> | Count on using a number line to find the difference; they can also draw cubes or other concrete objects to show what they need to calculate<br> | Find the difference between 8 and 5.<br><br>8 – 5, the difference is<br><br>Children to explore why<br>9 – 6 =<br>8 – 5 =<br>7 – 4 have the same difference |

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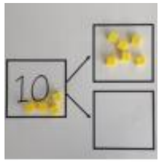
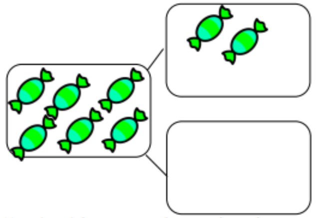
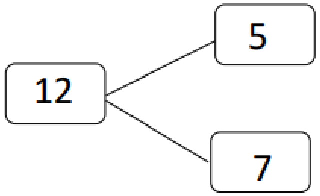
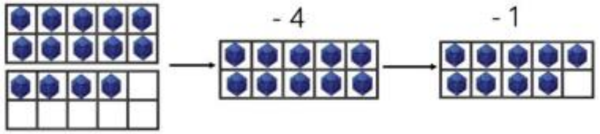
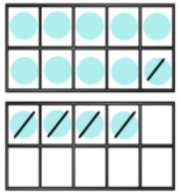
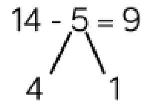
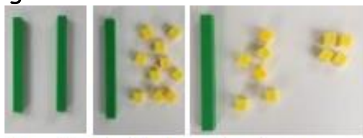
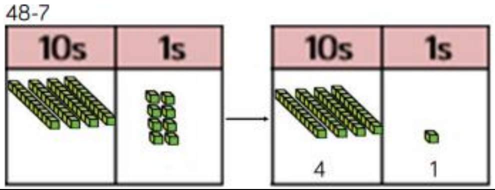
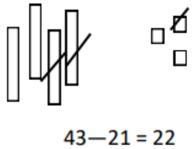
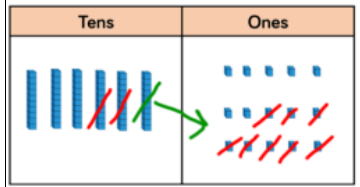
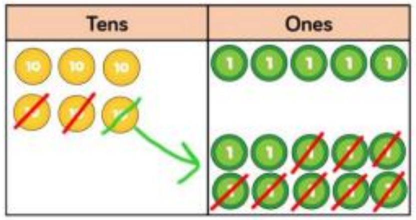
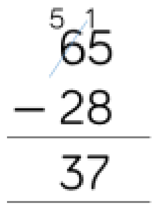
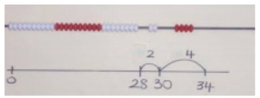
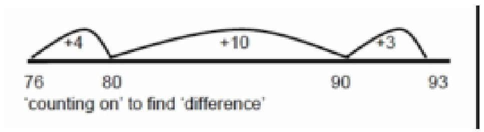
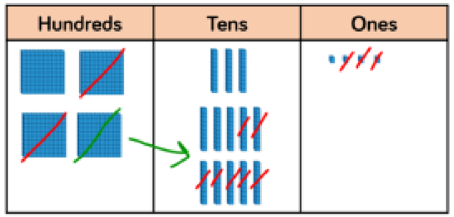
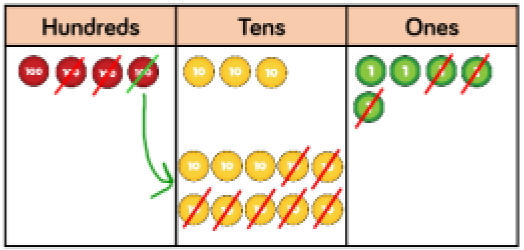
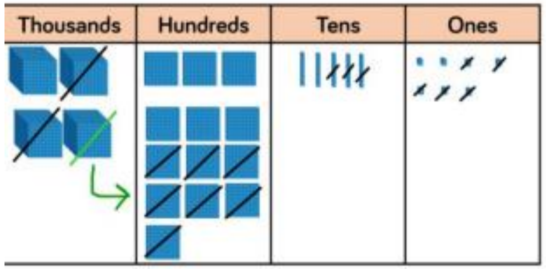
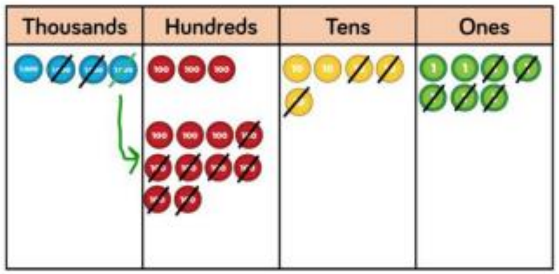
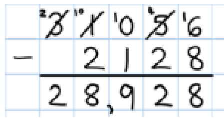
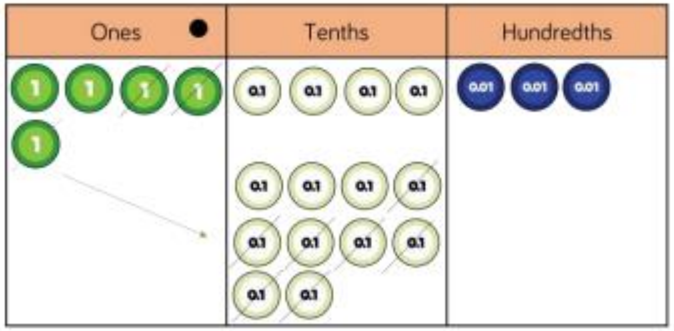
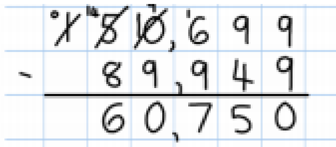
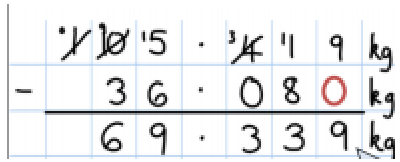
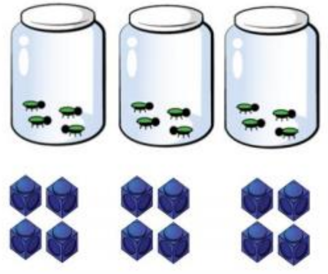
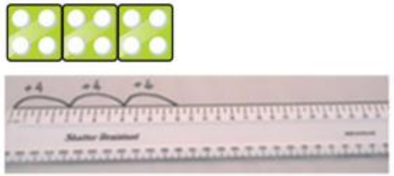
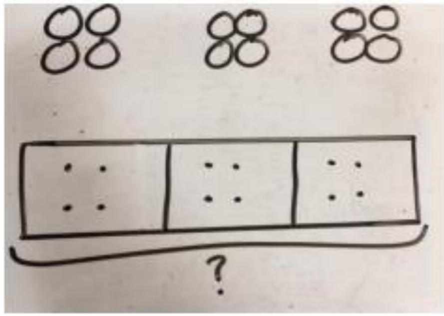
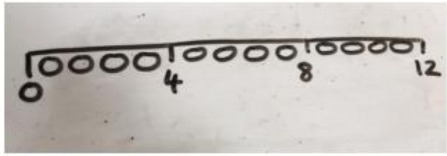
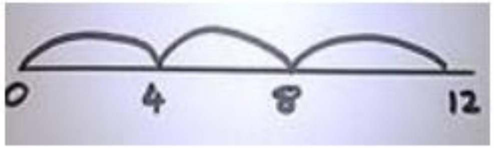
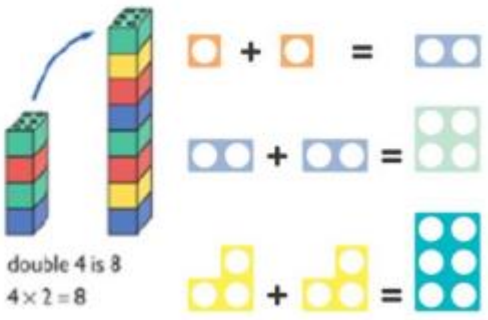
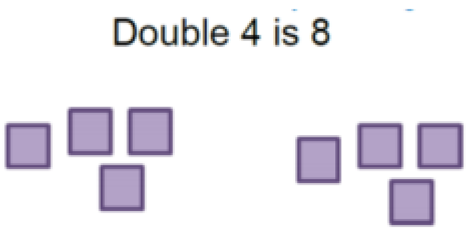
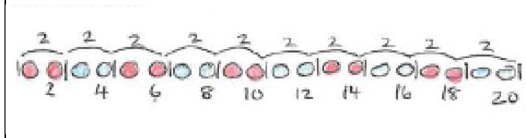
| **Part-part-whole model**<br><br>*Represent and use number bonds and related subtraction facts within 20* | Use part-part-whole models to show the link to addition (the inverse) with practical equipment<br><br><br>If 10 is the whole and 6 is one of the parts, what is the other part? | Draw the part-part-whole models pictorially<br> | Move to using numbers within part-part-whole models<br><br> |
| **Make 10** using the ten frame | Use a ten frame and counters or cubes to create numbers and subtract using number bonds to 10 (partition the subtracted number)<br><br>14 - 5<br><br> | Use number lines to count back to 10 and then beyond (bridging 10); they can also represent the ten frame pictorially and discuss what they did to make 10<br> | How many do we take off first to get to 10? How many left to take off?<br><br><br>14 - 4 = 10<br>10 - 1 = 9 |

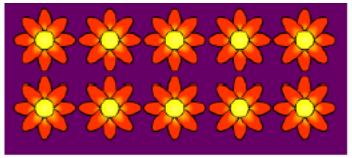
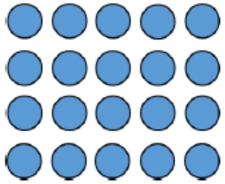
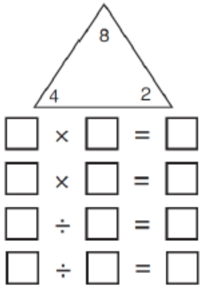
| Year 2 Subtraction | | | |
|---|---|---|---|
| **Regroup a ten into 10 ones**<br><br>*Regrouping = exchange* | Use Base 10 to show practically that we can exchange a 10 for 10 ones<br> | Show the exchange of a 10 for 10 ones in pictures<br> | Written calculation<br><br>20 - 4 = 16 |
| **Partitioning to subtract** (without exchange)<br><br>*Regrouping = exchanging tens for ones* | Use Base 10 to show how to partition the number when subtracting without exchange<br> | Children draw representations of Base 10 and show the subtraction by crossing off<br> | Begin to use column methods for 2-digit subtraction (without exchange)<br><br>43<br>− 21<br>___<br>___ |
| **Column method with exchange** (2-digit numbers) | Use Base 10 and place value counters to demonstrate exchange practically<br> | Children can draw representations of Base 10 and place value to demonstrate understanding, showing the exchange | Children become more confident with the column method of subtraction (with exchange )<br> |
| **Make 10** | Children count on to the next 10 and the rest using practical equipment<br><br>34—28 | Use a number line to count onto next 10 and the rest<br> | Written calculation<br><br>93 - 76 = 17 |

| Years 3 - 6 Subtraction | | | |
|---|---|---|---|
| Column method with exchange (up to 3-digit numbers)<br><br>Year 3<br><br>*Further practice of 3-digit subtraction with no exchange* | Use Base 10 and show the exchange practically; this can also be shown with place value counters (see below)<br><br> | Represent the Base 10 or place value counters pictorially, showing the exchange | Formal written method of column subtraction<br><br>$$\begin{array}{r} {}^{3}\cancel{4}\,{}^{1}35 \\ -\ 273 \\ \hline 262 \\ \hline \end{array}$$ |
| Column method with exchange (up to 4-digit numbers)<br><br>Year 4<br><br>*Introduce decimal subtraction in the context of money* | <br> | Represent place value counters pictorially, showing the exchange | Formal column method – children need to understand what has happened when they cross out digits (exchange)<br><br>$$\begin{array}{r} {}^{3}\cancel{4}\,{}^{1}357 \\ -\ 2735 \\ \hline 1622 \\ \hline \end{array}$$ |

| | | | |
|---|---|---|---|
| Column method with exchange (more than 4-digit numbers)<br><br>Years 5 / 6 | See above – practical equipment still useful to consolidate understanding of exchange | See above | Formal column method (extend understanding of 0s for place holders)  |
| Column method to subtract numbers with up to 3 decimal places (same number of decimal places)<br><br>Year 5 | Place value counters to represent decimals  | Children draw or represent counters on a place value grid that includes decimals | Formal column method, aligning decimal point accurately $\begin{array}{r} {}^{4}\cancel{5}.{}^{1}43 \\ -\ 2.7\phantom{0} \\ \hline 2.73 \end{array}$ |
| Column method to subtract larger numbers; decimals (different number of decimal places)<br><br>Year 6 | See above – practical equipment still used where needed to give clarity | See above | <br> |

| EYFS / Year 1 Multiplication | | | |
|---|---|---|---|
| **Objective and Strategy** | **Concrete** | **Pictorial** | **Abstract** |
| **Recognising and making equal groups; repeated addition** | Use cubes, Numicon and other objects in the classroom<br>3 x 4<br>4 + 4 + 4<br>There are 3 equal groups, with 4 in each group.<br><br>Number lines can also be used to show repeated groups<br> | Represent practical resources in a picture and use a bar model<br><br>Pictorial representation alongside a number line<br> | 3 x 4 = 12<br>4 + 4 + 4 = 12<br>Abstract number line showing 3 jumps of 4<br>3 × 4 = 12<br><br> |
| **Doubling** | Use cubes, Numicon and other objects in the classroom<br><br> | Draw pictures to show how to double numbers<br><br> | 4 x 2 = 8 |

| | | | |
|---|---|---|---|
| **Counting in multiples** | Use cubes, Numicon and other objects in the   classroom | Draw representations to show counting in multiples  | 2 x 4 = 8 |

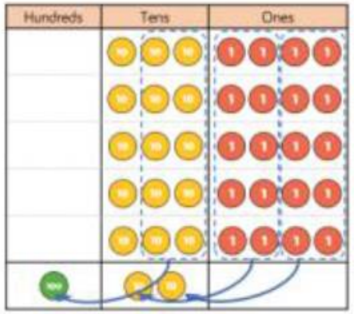
| Year 2 Multiplication | | | |
|---|---|---|---|
| **Arrays** – showing commutative multiplication | Objects can be laid out in arrays to find 2 lots of 5 (and 5 lots of 2) for example. Physical objects can also be used to create arrays (cubes)<br>  | Children draw their own arrays to show understanding<br> | 5 x 4 = 20<br><br>4 x 5 = 20<br><br>20 = 4 x 5<br><br>5 + 5 + 5 + 5<br><br>Children can use the arrays to write multiplication sentences reinforcing repeated addition |
| **Using the inverse relationship** | Children will use practical objects to explore the relationship between multiplication and division<br> |  | 2 x 4 = 8<br>4 x 2 = 8<br>8 ÷ 2 = 4<br>8 ÷ 4 = 2<br>8 = 2 x 4<br>8 = 4 x 2<br>2 = 8 ÷ 4<br>4 = 8÷ 2<br>Show all 8 related fact family sentences. |

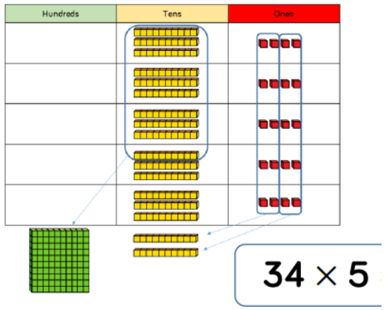
# Years 3 – 6 Multiplication

Column multiplication (2-digit x 1-digit numbers)

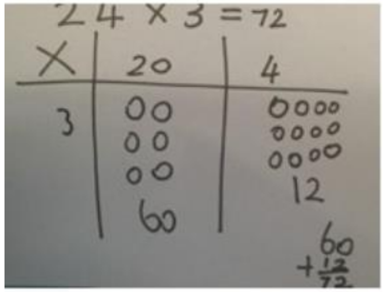
Year 3

Children use place value counters and Base 10 to multiply practically




Grid method may be drawn to help with understanding



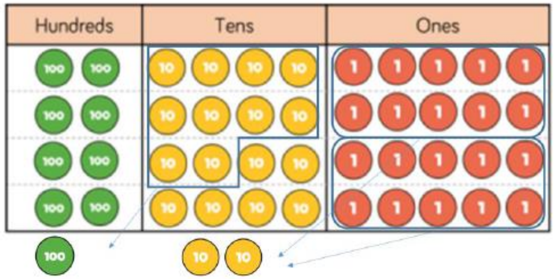
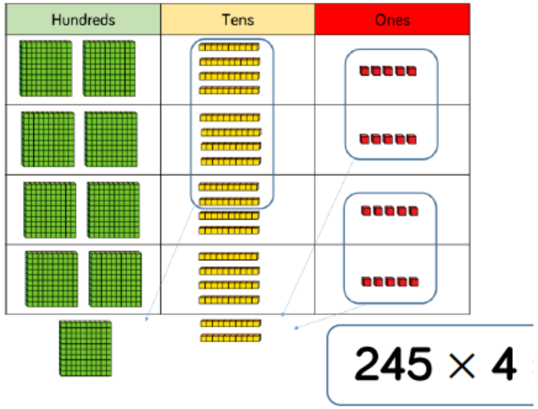

Children use understanding of practical methods to develop confidence with written methods of short multiplication (column multiplication) – expanded method

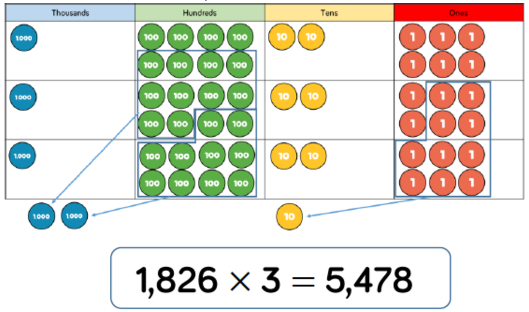
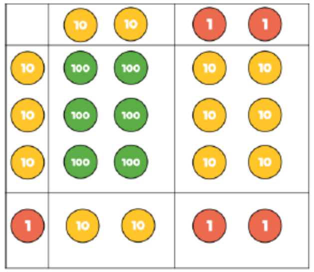
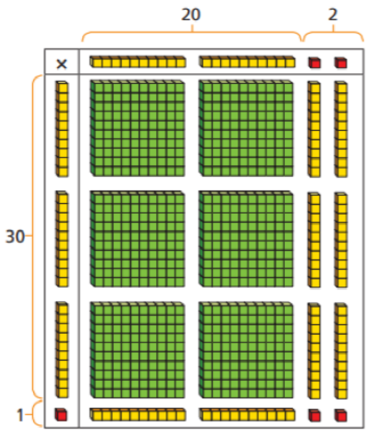
| | H | T | O | | |
|---|---|---|---|---|---|
| | | 3 | 4 | | |
| × | | | 5 | | |
| | | 2 | 0 | (5 × 4) | |
| + | 1 | 5 | 0 | (5 × 30) | |
| | 1 | 7 | 0 | | |

used

| | H | T | O | |
|---|---|---|---|---|
| | | 3 | 4 | |
| × | | | 5 | |
| | 1 | 7 | 0 | |
| | 1 | 2 | | |

sometimes first

<table>
<tr>
<td>Column multiplication (2 and 3-digit numbers multiplied by 1-digit)<br><br>Year 4</td>
<td>Children use place value counters and Base 10 to multiply practically, moving onto larger numbers and making sure they are always<br><br>
<br>
<br><br>multiplying the ones first</td>
<td>Children may continue to draw representations of Base 10 and place value counters but are encouraged to move towards the short, formal written method (see right)</td>
<td>
<table>
<tr><td></td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>2</td><td>4</td><td>5</td></tr>
<tr><td>×</td><td></td><td></td><td>4</td></tr>
<tr><td></td><td>9</td><td>8</td><td>0</td></tr>
<tr><td></td><td>1</td><td>2</td><td></td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>Column multiplication (up to 4-digit numbers multiplied by 1-digit numbers)<br><br>Year 5</td>
<td>See above (practical methods used as revision and where needed)<br>
</td>
<td>See above</td>
<td>Written method<br>
<table>
<tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>1</td><td>8</td><td>2</td><td>6</td></tr>
<tr><td>×</td><td></td><td></td><td></td><td>3</td></tr>
<tr><td></td><td>5</td><td>4</td><td>7</td><td>8</td></tr>
<tr><td></td><td>2</td><td></td><td>1</td><td></td></tr>
</table></td>
</tr>
<tr>
<td>Column multiplication (2-digit numbers multiplied by 2-digit numbers)<br><br>Year 5</td>
<td>Children use place value counters and Base 10 to multiply practically, moving to the abstract method<br><br>
</td>
<td>See above</td>
<td>Written method (grid method may be used as an initial method before moving onto the formal, written method)<br>
<table>
<tr><td>×</td><td>20</td><td>2</td></tr>
<tr><td>30</td><td>600</td><td>60</td></tr>
<tr><td>1</td><td>20</td><td>2</td></tr>
</table>
<table>
<tr><td></td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td></td><td>2</td><td>2</td></tr>
<tr><td>×</td><td></td><td>3</td><td>1</td></tr>
<tr><td></td><td></td><td>2</td><td>2</td></tr>
<tr><td></td><td>6</td><td>6</td><td>0</td></tr>
<tr><td></td><td>6</td><td>8</td><td>2</td></tr>
</table></td>
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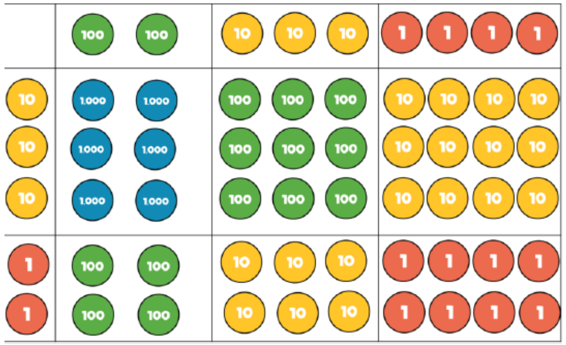
</table>

<table>
<tr>
<td>Column multiplication (3-digit numbers multiplied by 2-digit numbers)<br><br>Year 5</td>
<td>Children use place value counters and Base 10 to consolidate understanding<br><br></td>
<td>See above</td>
<td>Children look at links to the grid method but move quickly onto the formal, written method of column multiplication<br><br>
<table>
<tr><td>×</td><td>200</td><td>30</td><td>4</td></tr>
<tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr>
<tr><td>2</td><td>400</td><td>60</td><td>8</td></tr>
</table>
<br>
<table>
<tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>×</td><td></td><td>3</td><td>2</td></tr>
<tr><td></td><td>4</td><td>6</td><td>8</td></tr>
<tr><td>1 7</td><td>1 0</td><td>2</td><td>0</td></tr>
<tr><td>7</td><td>4</td><td>8</td><td>8</td></tr>
</table>
</td>
</tr>
<tr>
<td>Column multiplication (multi-digit up to 4-digits multiplied by a 2-digit number)<br><br>Year 6<br><br>Decimals (up to 2 decimal places by a single digit) can also be multiplied using the written method</td>
<td>Children should now be confident with the formal, written method of column multiplication. Practical equipment can be used to consolidate understanding. If children are still struggling with times tables, multiplication grids can be used as support so they can concentrate on the method</td>
<td></td>
<td>
<table>
<tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr>
<tr><td>×</td><td></td><td></td><td>2</td><td>8</td></tr>
<tr><td>2 (2)</td><td>1 (5)</td><td>9 (3)</td><td>1 (7)</td><td>2</td></tr>
<tr><td>5 (1)</td><td>4</td><td>7 (1)</td><td>8</td><td>0</td></tr>
<tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr>
</table>
<br>
<table>
<tr><td></td><td>3</td><td>·</td><td>1</td><td>9</td></tr>
<tr><td>×</td><td>8</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>5</td><td>·</td><td>5</td><td>2</td></tr>
<tr><td></td><td>1</td><td></td><td>7</td><td></td></tr>
</table>
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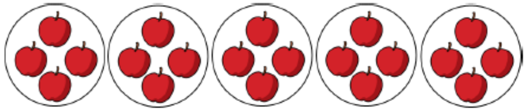
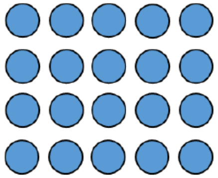
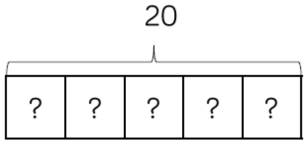
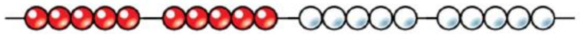
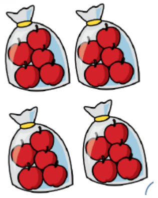
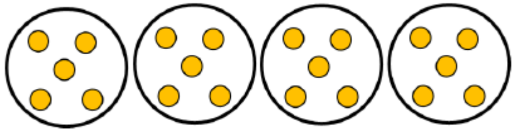
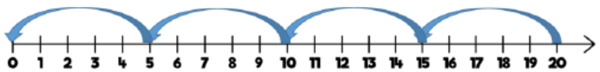
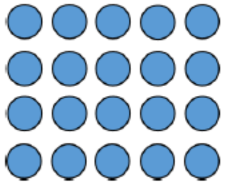
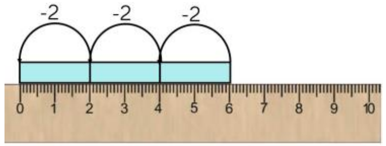
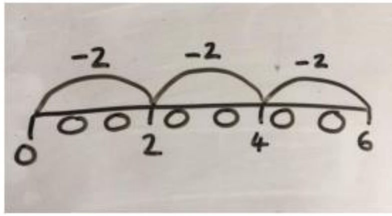
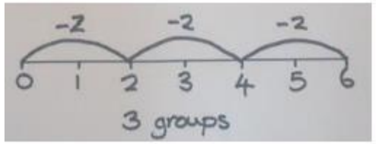
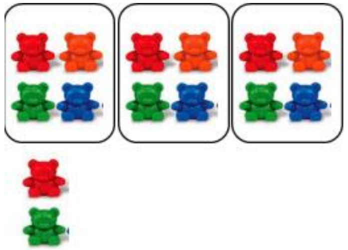
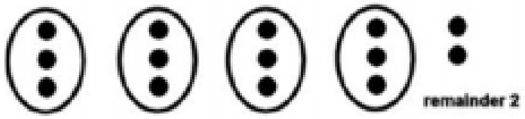
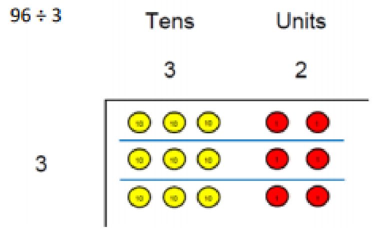
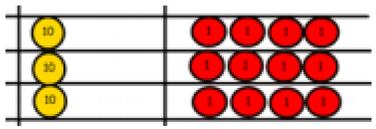
</tr>
</table>

| | EYFS / Year 1 Division | | |
|---|---|---|---|
| **Objective and Strategy** | **Concrete** | **Pictorial** | **Abstract** |
| **Sharing objects into groups** | Use cubes and other objects in the classroom<br><br> | Children use pictures or shapes to share amounts into equal groups.<br><br>They may also use arrays or bar models as different pictorial representations<br>  | At this stage, children do not need to record division formally but can use language like '20 shared between 5 is 4' |
| **Division as grouping**<br><br>*eg. I have 20 apples and put them in groups of 5. How many groups do I have?* | Use cubes and other practical manipulatives to group objects<br><br><br> | Draw pictures to show groupings<br><br>Children may also use number lines to count in groups, or multiples<br> | 20 ÷ 5 = 4 (children are introduced to the division symbol in Year 2) |

## Year 2 Division

| | | | |
|---|---|---|---|
| **Division within arrays** (links to multiplication) | Children link division to multiplication by making arrays practically and creating number sentences<br>15 ÷ 5 = 3<br>15 ÷ 3 = 5<br>3 x 5 = 15<br>5 x 3 = 15<br> | Children draw arrays and use lines to split them into groups, making multiplication and division sentences<br> | Children create division and multiplication families<br>4 x 5 = 20<br>5 x 4 = 20<br>20 ÷ 4 = 5<br>20 ÷ 5 = 4 |
| **Repeated subtraction** | Children use practical objects to subtract groups from a number ('chunks' of 2 for example)<br><br>3 groups of 2 | Children represent repeated subtraction pictorially<br> | Children use an abstract number line to represent the equal groups that have been subtracted<br> |
| **Division with a remainder** (times tables facts; repeated subtraction) | Divide practical objects into groups and see how many are left over ('remainders'). Cubes, lollipop sticks etc can be used<br><br>14 ÷ 4 = 3 r 2 | Children draw pictures to show remainders when dividing<br><br>14 ÷ 3 = 4 r 2 | Children understand that not all numbers divide perfectly (links to times tables)<br>12 ÷ 3 = 4 (no remainder)<br>13 ÷ 3 = 4 r 1 |

| Years 3 – 6 Division | | | |
|---|---|---|---|
| Division of 2-digit numbers by a 1-digit number (no exchange; short division introduced as an efficient method)<br><br>Year 3 | Children use Base 10 to start dividing larger numbers, partitioning into tens and ones. Place value counters will also be used to share numbers into equal groups<br> | Children can represent the place value counters pictorially (see left)<br><br>Children continue to recognise division as both sharing and grouping throughout KS2 | Bus stop method (no exchange)<br><br>3 2<br>3 \| 9 6 |
| Division with a remainder<br><br>Year 3 | Children continue to explore division with remainders, reviewing smaller numbers using practical equipment (see Year 2) | | |
| Division of 2-digit numbers by a 1-digit number (sharing with exchange)<br><br>Year 3 | Children use Base 10 and then place value counters to exchange. Here, we are dividing 42 into 3 equal groups (or rows). We start with the tens; we can put 1 ten in each group and have 1 ten left over. We exchange this ten for 10 ones and then divide the ones equally between the 3 groups<br><br>42 ÷ 3 = 14 | Children draw the place value counters to demonstrate understanding (supporting the practical method). Children can clearly see the equal groups<br> | Children extend understanding of the bus stop method using exchange (showing understanding of remainders)<br>1 4<br>3 \| 4 $^{1}$2 |

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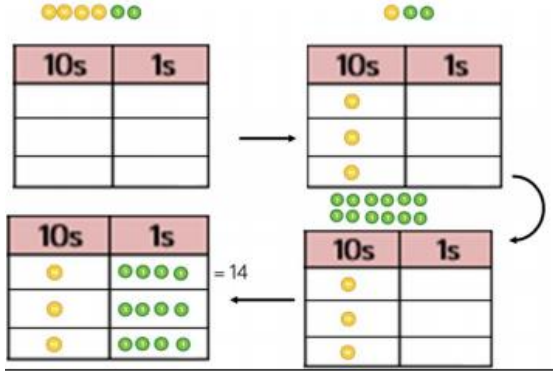
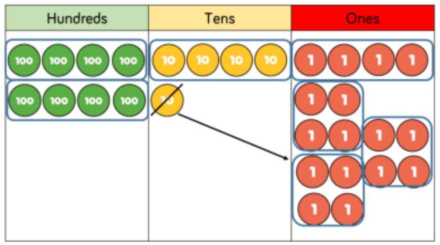
| |  | | |
| Short division (up to 3-digits by a 1-digit number)<br><br>Year 4 | Children continue to use Base 10 and place value counters to share 3-digit numbers into equal groups. Start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. Exchange can also be used<br><br>844 ÷ 4 = 211<br>*sharing*<br><br><br>856 ÷ 4 = 214<br>*grouping*<br> | Children draw the place value counters to demonstrate understanding (see left) | Children continue to use the bus stop method (with and without exchange)<br><br>2 1 1<br>4 \| 8 4 4<br><br>2 1 4<br>4 \| 8 5 $^{1}$6 |

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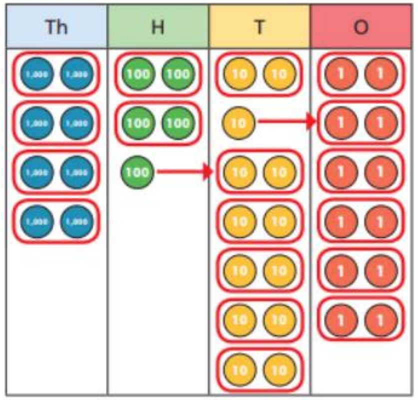
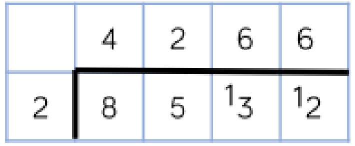
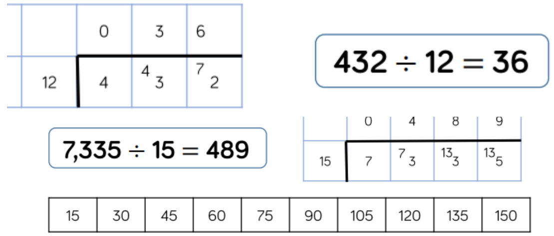
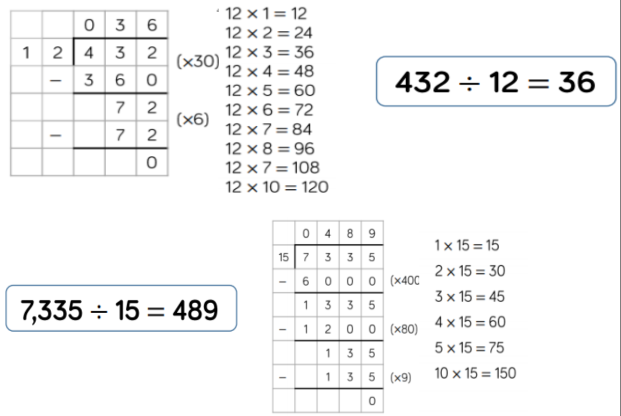
| Short division (up to 4-digits by a 1-digit number, including remainders)<br><br>Year 5 | Place value counters can continue to be used to support understanding of division<br><br>8532 ÷ 2 = 4266<br> | Children can draw their own counters and group them pictorially | Children use the short method of division with increasing confidence when dividing numbers with multiple exchanges<br> |
| Short division (up to 4-digits by a 2-digit number)<br><br>Year 6 | When children begin to divide larger numbers, written methods become more efficient; concrete and pictorial methods are less effective (see right) | | Children can write out multiples to support<br><br>calculations with larger remainders |
| Long division (multi-digits by a 2-digit number)<br><br>Year 6 | | |  |

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<td>When a remainder is left at the end of a calculation, children can leave it as a remainder or convert it to a fraction, depending on the question. They may also need to round<br><br>$372 \div 15 = 24\ r12$<br><br>$$\begin{array}{r} 24\ r\ 12 \\ 15\overline{)372} \\ -\ 300 \\ \hline 72 \\ -\ 60 \\ \hline 12 \end{array}$$<br>$1 \times 15 = 15$<br>$2 \times 15 = 30$<br>$3 \times 15 = 45$<br>$4 \times 15 = 60$<br>$5 \times 15 = 75$<br>$10 \times 15 = 150$<br><br>$$\begin{array}{r} 24\tfrac{4}{5} \\ 15\overline{)372} \\ -\ 300 \\ \hline 72 \\ -\ 60 \\ \hline 12 \end{array}$$<br>$372 \div 15 = 24\frac{4}{5}$</td>
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