# Mousehole School Calculation Policy

This policy is intended to detail which calculation strategies are taught in each year group. It was developed to ensure continuity of approach between classes and to act as a supporting document. It is not exhaustive and children are encouraged to select the most accurate and efficient methods depending on the nature of the calculation, the numbers involved and their own learning preference.

This policy has been written in conjunction with the Maths Policy and appears as an appendix to it.

# KEY STAGE 1

Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, children will develop an understanding of how numbers work, so that they are confident with 2-digit numbers and beginning to read and say numbers above 100.

**Addition and Subtraction:** A focus on number bonds, first via practical hands-on experiences and subsequently using memorisation techniques, enables a good grounding in these crucial facts, and ensures that all children leave Year 2 knowing the pairs of numbers which make all the numbers up to 10 at least. Children will also have experienced and been taught pairs to 20. Children's knowledge of number facts enables them to add several 1-digit numbers, and to add/subtract a 1-digit number to/from a 2-digit number. Another important conceptual tool is the ability to add/subtract 1 or 10, and to understand which digit changes and why. This understanding is extended to enable children to add and subtract multiples of 10 to and from any 2-digit number. The most important application of this knowledge is the ability to add or subtract any pair of 2-digit numbers by counting on or back in 10s and 1s. Children may extend this to adding by partitioning numbers into 10s and 1s.

**Multiplication and Division:** Children will be taught to count in 2s, 3s, 5s and 10s, and will relate this skill to repeated addition. Children will meet and begin to learn the associated ×2, ×3, ×5 and ×10 tables. Engaging in a practical way with the concept of repeated addition and the use of arrays enables children to develop a preliminary understanding of multiplication, and asking them to consider how many groups of a given number make a total will introduce them to the idea of division. Children will also be taught to double and halve numbers, and will thus experience scaling up or down as a further aspect of multiplication and division.

**Fractions:** Fractions will be introduced as numbers and as operators, specifically in relation to halves, quarters and thirds.

**Problem solving:**

Solving simple concrete problems

Recognise and create repeating patterns

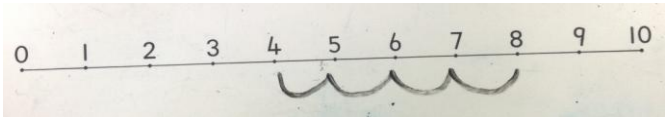
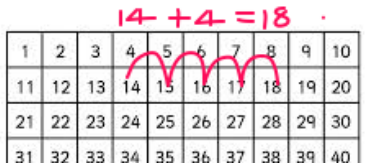
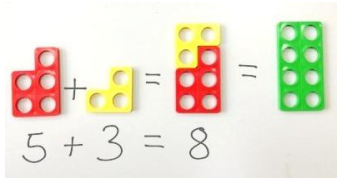
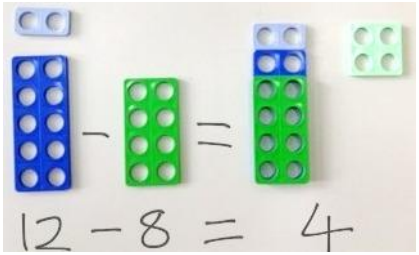
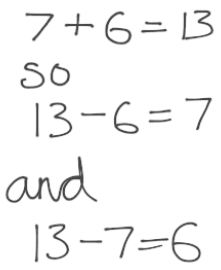
Missing number problems

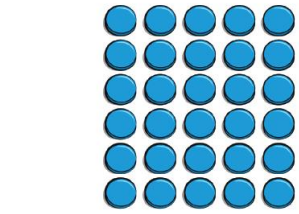
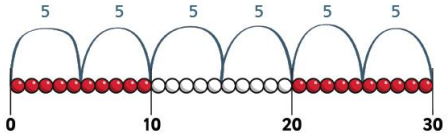
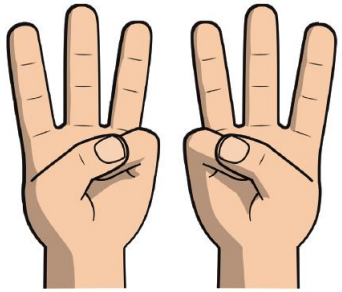
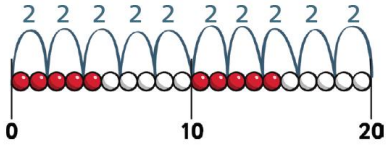
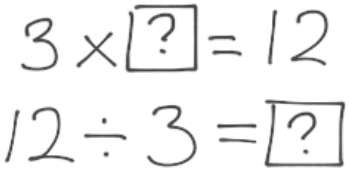
Addition and subtraction: Solve simple one step problems using concrete objects and pictorial representations

Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

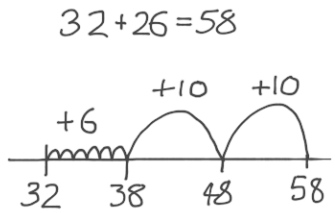
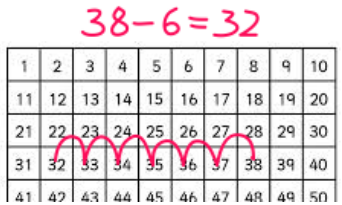
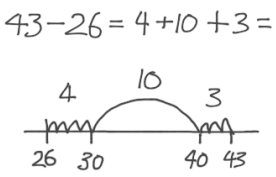
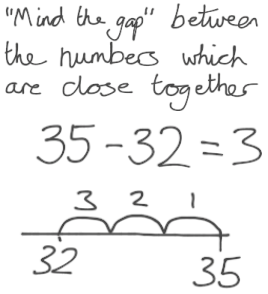
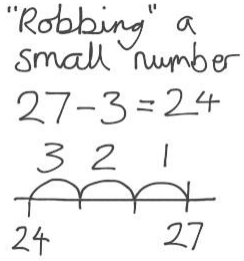
Multiplication an division: solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

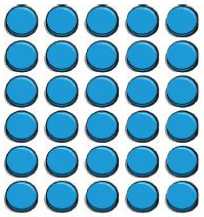
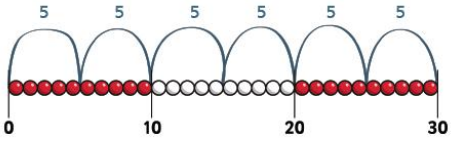
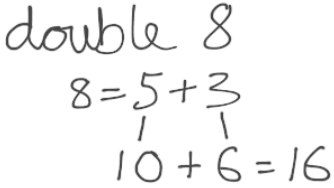
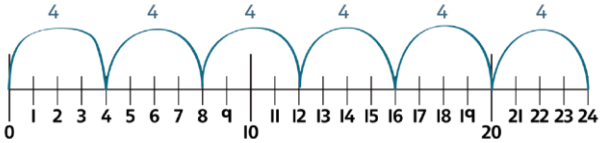
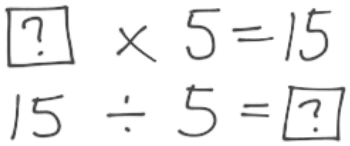
# Year 1

| | Mental calculation | Formal calculation | Default for ALL children |
|---|---|---|---|
| ***Y1 +*** | Number bonds ('story' of 5, 6, 7, 8, 9 and 10)<br>Count on in 1s from a given 2-digit number<br>Add two 1-digit numbers<br>Add three 1-digit numbers, spotting doubles or pairs to 10<br>Count on in 10s from any given 2-digit number<br>Add 10 to any given 2-digit number<br>Use number facts to add 1-digit numbers to 2-digit numbers<br>e.g. *Use 4 + 3 to work out 24 + 3, 34 + 3*<br>Add by putting the larger number first | Using a number track to count on<br>  <br><br>Use a number square to count on<br>  <br><br>  <br><br>Counting objects and using Numicon to model calculations | Pairs with a total of 10<br>Count in 1s<br>Count in 10s<br>Count on 1 from any given 2-digit number |
| ***Y1 –*** | Number bonds ('story' of 5, 6, 7, 8, 9 and 10)<br>Count back in 1s from a given 2-digit number<br>Subtract one 1-digit number from another<br>Count back in 10s from any given 2-digit number<br>Subtract 10 from any given 2-digit number<br>Use number facts to subtract 1-digit numbers from 2-digit numbers<br>e.g. *Use 7 – 2 to work out 27 – 2, 37 – 2* | Develop inverse understanding alongside adding<br>Using a number track to count back<br>Use a number square to count back<br>Counting objects and using Numicon to model calculations<br>  <br><br>  <br> | Pairs with a total of 10<br>Count back in 1s from 20 to 0<br>Count back in 10s from 100 to 0<br>Count back 1 from any given 2-digit number |

| | | | |
|---|---|---|---|
| ***Y1*** <br> **×** | Begin to count in 2s, 5s and 10s<br>Begin to say what three 5s are by counting in 5s, or what four 2s are by counting in 2s, etc.<br>Double numbers to 10 | Arrays<br>*e.g. 6 × 5 as six steps in the 5s count as well as six lots of five*<br>  <br>  <br>As repeated addition<br>4 x 3 = 3 x 4<br>= 4 + 4 + 4<br>= 3 + 3 + 3 + 3<br><br>Doubling and halving | Begin to count in 2s and 10s<br>Double numbers to 5 using fingers<br>  |
| ***Y1*** <br> **÷** | Begin to count in 2s, 5s and 10s<br>Find half of even numbers to 12 and know it is hard to halve odd numbers<br>Find half of even numbers by sharing<br>Begin to use visual and concrete arrays or ‘sets of’ to find how many sets of a small number make a larger number | “Clever” counting (counting in 2s or 5s)<br>Count in 2s<br>  <br>Recognising as inverse of multiplication<br>  | Begin to count in 2s and 10s<br>Find half of even numbers by sharing |

# Year 2

| | Mental calculation | Written calculation | Default for ALL children |
|---|---|---|---|
| **Y2 +** | Number bonds – know all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20<br>Count on in 1s and 10s from any given 2-digit number<br>Add two or three 1-digit numbers<br>Add a 1-digit number to any 2-digit number using number facts, including bridging multiples of 10<br>e.g. *45 + 4*<br>e.g. *38 + 7*<br>Add 10 and small multiples of 10 to any given 2-digit number<br>Add any pair of 2-digit numbers | Make links between number facts e.g.<br>5 + 3 = 8 so<br>35 + 3 = 38<br>5 + 63 = 68<br>Using number lines to count on (units first then tens)<br>  | Know pairs of numbers which make each total up to 10<br>Add two 1-digit numbers<br>Add a 1-digit number to a 2-digit number by counting on in 1s<br>Add 10 and small multiples of 10 to a 2-digit number by counting on in 10s |
| **Y2 –** | Number bonds – know all the pairs of numbers which make all the numbers to 12<br>Count back in 1s and 10s from any given 2-digit number<br>Subtract a 1-digit number from any 2-digit number using number facts, including bridging multiples of 10<br>e.g. *56 – 3*<br>e.g. *53 – 5*<br>Subtract 10 and small multiples of 10 from any given 2-digit number<br>Subtract any pair of 2-digit numbers by counting back in 10s and 1s or by counting up |  <br>Count back to take away using a number line or square<br>  <br>Counting in units and then tens<br>Counting back (robbery)<br>Finding the difference (mind the gap)<br>  | Know pairs of numbers which make each total up to 10<br>Subtract a 1-digit number from a 2-digit number by counting back in 1s<br>Subtract 10 and small multiples of 10 from a<br>2-digit number by counting back in 10s<br>  |

| | | | |
|---|---|---|---|
| **Y2 ×** | Count in 2s, 5s and 10s<br>Begin to count in 3s<br>Begin to understand that multiplication is repeated addition and to use arrays<br>e.g. *3 × 4 is three rows of 4 dots*<br>Begin to learn the ×2, ×3, ×5 and ×10 tables, seeing these as 'lots of'<br>e.g. *5 lots of 2, 6 lots of 2, 7 lots of 2*<br>Double numbers up to 20<br>Begin to double multiples of 5 to 100<br>Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5 | Arrays<br>  <br>  <br><br>Understand that 5 x 3 can be worked out as three 5s or five 3s<br>As repeated addition<br>4 x 3 = 4 + 4 + 4 = 3 + 3 + 3 + 3<br>Language of scaling:<br>Lots of ... groups of... n times bigger... | Count in 2s, 5s and 10s<br>Begin to use and understand simple arrays<br>e.g. *2 × 4 is two lots of four*<br>Double numbers up to 10<br>  <br><br>Double multiples of 10 to 50 |
| **Y2 ÷** | Count in 2s, 5s and 10s<br>Begin to count in 3s<br>Using fingers, say where a given number is in the 2s, 5s or 10s count<br>e.g. *8 is the fourth number when I count in 2s*<br>Relate division to grouping<br>e.g. *How many groups of 5 in 15?*<br>Halve numbers to 20<br>Begin to halve numbers to 40 and multiples of 10 to 100<br>Find $^1/_2$, $^1/_3$, $^1/_4$ and $^3/_4$ of a quantity of objects and of amounts (whole number answers) | Clever" counting (counting in 2s or 5s)<br>  <br><br>"How many groups of five do I count to get to twenty?"<br>  <br><br>Recognising as inverse of multiplication<br>Begin to recognise ½ and ¼ of small quantities | Count in 2s, 5s and 10s<br>Say how many rows in a given array<br>e.g. *How many rows of 5 are in an array of 3 × 5?*<br>Halve numbers to 12<br>Find $^1/_2$ of amounts |

# LOWER KEY STAGE 2

In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.

| | | |
|---|---|---|
| **Addition and subtraction:** Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the 'counting in 1s' or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced. | **Multiplication and division:** This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12 × 12. Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but 'friendly' numbers, e.g. when dividing by 5 or multiplying by 20. | **Fractions and decimals:** Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form, as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, multiplying and dividing whole numbers by 10 and 100. |

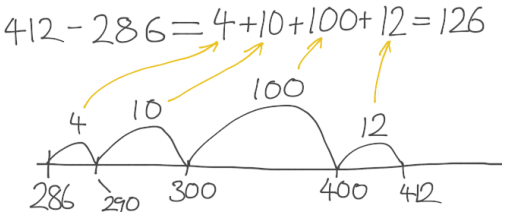
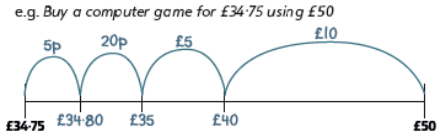
**Solving problems:**

Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).

Using a variety of representations to solve problems across the whole maths curriculum and specifically:

- Missing number problems
- One step and two step data handling problems
- Addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
- Simple measure and money problems involving fractions and decimals to two decimal places.
- Converting from hours to minutes; minutes to seconds; years to months; weeks to days.

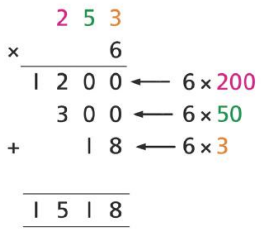
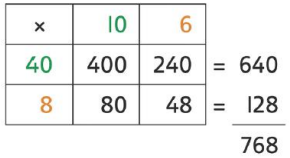
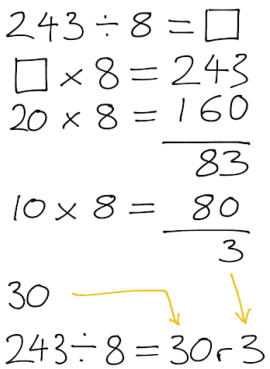
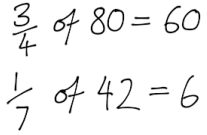
# Year 3

| | Mental calculation | Written calculation | Default for ALL children |
|---|---|---|---|
| **Y3 +** | Know pairs with each total to 20<br>e.g. *2 + 6 = 8, 12 + 6 = 18, 7 + 8 = 15*<br>Know pairs of multiples of 10 with a total of 100<br>Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning<br>Add multiples and near multiples of 10 and 100<br>Perform place-value additions without a struggle<br>e.g. *300 + 8 + 50 = 358*<br>Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number<br>e.g. *104 + 56 is 160 since 104 + 50 = 154 and 6 + 4 = 10*<br>*676 + 8 is 684 since 8 = 4 + 4 and 76 + 4 + 4 = 84*<br>Add pairs of 'friendly' 3-digit numbers<br>e.g. *320 + 450*<br>Begin to add amounts of money using partitioning | Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers<br><br>Expanded column<br>324 + 537 = 861<br>300 20 4<br>+ 500 30 7<br>800 60 1<br>10<br><br>Begin to use compact column addition to add numbers with 3 digits<br><br>Compact column<br>538 + 624 = 1162<br>538<br>+624<br>1162<br>1<br><br>Begin to add like fractions<br>e.g. $^3/_8 + {}^1/_8 + {}^1/_8$<br>Recognise fractions that add to 1<br>e.g. $^1/_4 + {}^3/_4$<br>e.g. $^3/_5 + {}^2/_5$ | Know pairs of numbers which make each total up to 10, and which total 20<br>Add two 2-digit numbers by counting on in 10s and 1s<br>e.g. *56 + 35 is 56 + 30 and then add the 5*<br>Understand simple place-value additions<br>e.g. *200 + 40 + 5 = 245*<br>Use place value to add multiples of 10 or 100 |
| **Y3 –** | Know pairs with each total to 20<br>e.g. *8 – 2 = 6*<br>e.g. *18 – 6 = 12*<br>e.g. *15 – 8 = 7*<br>Subtract any two 2-digit numbers<br>Perform place-value subtractions without a struggle e.g. *536 – 30 = 506*<br>Subtract 2-digit numbers from numbers > 100 by counting up<br>Subtract multiples and near multiples of 10 and 100<br>Find change from £1, £5 and £10 |  <br>Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers<br><br>  | Know pairs of numbers which make each total up to 10, and which total 20<br>Count up to subtract 2-digit numbers<br>e.g. *72 – 47*<br>Subtract multiples of 5 from 100 by counting up<br>e.g. *100 – 35*<br>Subtract multiples of 10 and 100 |

<table>
<tr>
<td>Y3<br>×</td>
<td>Know by heart all the multiplication facts in the ×2, ×3, ×4, ×5, ×8 and ×10 tables<br>Multiply whole numbers by 10 and 100<br>Recognise that multiplication is commutative<br>Use place value and number facts in mental multiplication<br>e.g. 30 × 5 is 15 × 10<br>Partition teen numbers to multiply by a 1-digit number<br>e.g. 3 × 14 as 3 × 10 and 3 × 4<br>Double numbers up to 50</td>
<td>Use partitioning (grid multiplication) to multiply<br>2-digit and 3-digit numbers by ‘friendly’ 1-digit numbers<br><br>e.g. 253 × 6<br><br><table><tr><td>×</td><td>200</td><td>50</td><td>3</td></tr><tr><td>6</td><td>1200</td><td>300</td><td>18</td></tr></table> = 1518</td>
<td>Know by heart the ×2, ×3, ×5 and ×10 tables<br>Double given tables facts to get others<br>Double numbers up to 25 and multiples of 5 to 50</td>
</tr>
<tr>
<td>Y3<br>÷</td>
<td>Know by heart all the division facts derived from the ×2, ×3, ×4, ×5, ×8 and ×10 tables<br>Divide whole numbers by 10 or 100 to give whole number answers<br>Recognise that division is not commutative<br>Use place value and number facts in mental division<br>e.g. 84 ÷ 4 is half of 42<br>Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders<br>e.g. 57 ÷ 3 is 10 + 9 as 10 × 3 = 30 and 9 × 3 = 27<br>Halve even numbers to 100, halve odd numbers to 20</td>
<td>8 6 ÷ 3 = □<br><br>□ × 3 = 8 6<br>2 0 × 3 = 6 0<br>2 6<br>8 × 3 = 2 4<br>2<br>2 8<br><br>8 6 ÷ 3 = 2 8 r2<br><br>Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number<br><br>Find unit fractions of quantities and begin to find non-unit fractions of quantities</td>
<td>Know by heart the division facts derived from the ×2, ×3, ×5 and ×10 tables<br>Halve even numbers up to 50 and multiples of 10 to 100<br>Perform divisions within the tables including those with remainders<br>e.g. 38 ÷ 5</td>
</tr>
</table>

# Year 4

| | Mental calculation | Written calculation | Default for ALL children |
|---|---|---|---|
| **Y4 +** | Add any two 2-digit numbers by partitioning or counting on<br>Know by heart/quickly derive number bonds to 100 and to £1<br>Add to the next 100, £1 and whole number<br>e.g. *234 + 66 = 300*<br>e.g. *3·4 + 0·6 = 4*<br>Perform place-value additions without a struggle<br>e.g. *300 + 8 + 50 + 4000 = 4358*<br>Add multiples and near multiples of 10, 100 and 1000<br>Use place value and number facts to add 1-, 2-, 3- and 4-digit numbers where a mental calculation is appropriate<br>e.g. *4004 + 156 = 4160* | Column addition for 3-digit and 4-digit numbers<br>e.g. or<br>Compact column<br>538 + 624 = 1162<br>538<br>+624<br>1162<br>1<br>347<br>286<br>495 +<br>1128<br>21<br>Add like fractions<br>e.g. $^3/_5 + {}^4/_5 = {}^7/_5 = 1\ {}^2/_5$<br>Be confident with fractions that add to 1 and fraction complements to 1 e.g. $^2/_3 + \_ = 1$ | Add any 2-digit numbers by partitioning or counting on<br>Number bonds to 20<br>Know pairs of multiples of 10 with a total of 100<br>Add 'friendly' larger numbers using knowledge of place value and number facts<br>Use expanded column addition to add 3-digit numbers |
| **Y4 –** | Subtract any two 2-digit numbers<br>Know by heart/quickly derive number bonds to 100<br>Perform place-value subtractions without a struggle<br>e.g. *4736 – 706 = 4030*<br>Subtract multiples and near multiples of 10, 100, 1000, £1 and 10p<br>Subtract multiples of 0·1<br>Subtract by counting up<br>e.g. *503 – 368 is done by adding*<br>*368 + 2 + 30 + 100 + 3 (so we added 135)*<br>Subtract, when appropriate, by counting back or taking away, using place value and number facts<br>Subtract £1, 10p, 1p from amounts of money<br>Find change from £10, £20 and £50 | Expanded column<br>726 – 358 = 368<br>600 100 16<br>~~700~~ ~~20~~ 6<br>– 300 50 8<br>300 60 8<br>Use expanded column subtraction for 3- and 4-digit numbers<br>Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100<br>2002 – 1865 = 35 + 102 = 137<br>35 102<br>1865 1900 2002 | Use counting up with confidence to solve most subtractions, including finding complements to multiples of 100<br>e.g. *512 – 287*<br>e.g. *67 + _ = 100*<br>Use fractions that add to 1 to find fraction complements to 1 |

<table>
<tr>
<td>Y4<br>×</td>
<td>Know by heart all the multiplication facts up to 12 × 12<br>Recognise factors up to 12 of 2-digit numbers<br>Multiply whole numbers and 1-place decimals by 10, 100, 1000<br>Multiply multiples of 10, 100 and 1000 by 1-digit numbers e.g. 300 × 6<br>e.g. 4000 × 8<br>Use understanding of place value and number facts in mental multiplication<br>e.g. 36 × 5 is half of 36 × 10<br>e.g. 50 × 60 = 3000<br>Partition 2-digit numbers to multiply by a 1-digit number mentally e.g. 4 × 24 as 4 × 20 and 4 × 4<br>Begin to double amounts of money<br>e.g. £35·60 doubled is £71·20</td>
<td>e.g. 253 × 6<br>  <br><br>e.g. 16 × 48<br>  <br></td>
<td>Use a vertical written method to multiply a 1-digit number by a 3-digit number (ladder method)<br>Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method)</td>
<td>Know by heart multiplication tables up to 10 × 10<br>Multiply whole numbers by 10 and 100<br>Use the grid method to multiply a 2-digit or a 3-digit number by a number ≤ 6</td>
</tr>
<tr>
<td>Y4<br>÷</td>
<td>Know by heart all the division facts up to 144 ÷ 12<br>Divide whole numbers by 10, 100, to give whole number answers or answers with 1 decimal place<br>Divide multiples of 100 by 1-digit numbers using division facts<br>e.g. 3200 ÷ 8 = 400<br>Use place value and number facts in mental division<br>e.g. 245 ÷ 20 is half of 245 ÷ 10<br>Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate<br>e.g. 156 ÷ 6 is 20 + 6 as 20 × 6 = 120 and 6 × 6 = 36<br>Find halves of even numbers to 200 and beyond using partitioning<br>Begin to halve amounts of money<br>e.g. half of £52·40 is £26·20</td>
<td>  <br><br>  <br></td>
<td>Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number<br>Give remainders as whole numbers<br>Begin to reduce fractions to their simplest forms<br>Find unit and non-unit fractions of larger amounts</td>
<td>Know by heart all the division facts up to 100 ÷ 10<br>Divide whole numbers by 10 and 100 to give whole number answers or answers with 1 decimal place<br>Perform divisions just above the 10th multiple using the written layout and understanding how to give a remainder as a whole number<br>Find unit fractions of amounts</td>
</tr>
</table>

## UPPER KEY STAGE 2

Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions.

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| **Addition and subtraction:** Children will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to 2 decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Negative numbers will be added and subtracted. | **Multiplication and division:** Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as *40 000* × *6* or *40 000* ÷ *8*. In addition, it is in Years 5 and 6 that children extend their knowledge and confidence in using written algorithms for multiplication and division. | **Fractions, decimals, percentages and ratio:** Fractions and decimals are also added, subtracted, divided and multiplied, within the bounds of children's understanding of these more complicated numbers. Children will also calculate simple percentages and ratios. |

**Problem Solving**

Solve problems involving all four operations specifically:

- multi-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.
- multiplication and division problems including simple fractions and problems involving simple rates and knowledge of factors and multiples, squares and cubes
- addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- involving numbers up to three decimal places
- percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25
- going beyond the measurement and money models of decimals, for example, by solving puzzles involving decimals.
- solving comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information in tables, including timetables
- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- involving similar shapes where the scale factor is known or can be found
- measures problems: involving time [converting between units of time], money and measure [for example, length, mass, volume, money] using decimal notation, including scaling and problems which require answers to be rounded to specified degrees of accuracy
- involving unequal quantities, for example, 'for every egg you need three spoonfuls of flour', 'of the class are boys'. These problems are the foundation for later formal approaches to ratio and proportion

| Year 5 | | | |
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| | **Mental calculation** | **Written calculation** | **Default for ALL children** |
| ***Y5 +*** | Know number bonds to 1 and to the next whole number<br>Add to the next 10 from a decimal number<br>e.g. *13·6 + 6·4 = 20*<br>Add numbers with 2 significant digits only, using mental strategies e.g. *3·4 + 4·8*<br>e.g. *23 000 + 47 000*<br>Add 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. *8000 + 7000*<br>Add near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers e.g. *82 472 + 30 004*<br>Add decimal numbers which are near multiples of 1 or 10, including money e.g. *6·34 + 1·99*<br>Use place value and number facts to add two or more 'friendly' numbers, including money and decimals<br>e.g. *3 + 8 + 6 + 4 + 7*<br>e.g. *0·6 + 0·7 + 0·4* | Use column addition to add two or three whole numbers with up to 5 digits<br>Use column addition to add any pair of 2-place decimal numbers, including amounts of money<br>15·68<br>27·86 +<br>43·54<br>11·1<br>Begin to add related fractions using equivalences<br>e.g. $^1/_2 + {}^1/_6 = {}^3/_6 + {}^1/_6$<br>Choose the most efficient method in any given situation | Add numbers with only 2 digits which are not zeros<br>e.g. *3·4 + 5·8*<br>Derive swiftly and without any difficulty number bonds to 100<br>Add 'friendly' large numbers using knowledge of place value and number facts<br>e.g. 243 + 406 = 649<br>Use expanded column addition to add pairs of 4- and 5-digit numbers |
| ***Y5 –*** | Subtract numbers with 2 significant digits only, using mental strategies<br>e.g. *6·2 – 4·5*<br>e.g. *72 000 – 47 000*<br>Subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000<br>e.g. *8000 – 3000*<br>e.g. *60 000 – 200 000*<br>Subtract 1- or 2-digit near multiples of 10, 100, 1000, 10 000 and 100 000 from other numbers<br>e.g. *82 472 – 30 004*<br>Subtract decimal numbers which are near multiples of 1 or 10, including money | Choose the most efficient method in any given situation<br>Use compact or expanded column subtraction to subtract numbers with up to 5 digits<br>2 14 7 15<br>3 4 6 8 5<br>1 6 4 5 8 –<br>1 8 2 2 7<br>Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money | Derive swiftly and without difficulty number bonds to 100<br>Use counting up with confidence to solve most subtractions, including finding complements to multiples of 1000<br>e.g. *3000 – 2387* |

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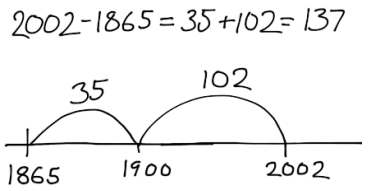
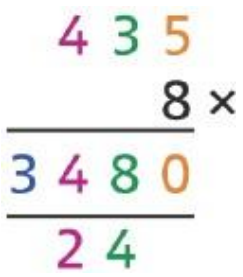
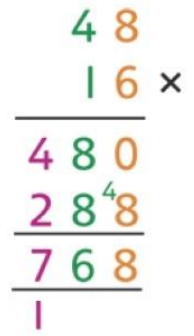
| | e.g. *6·34 – 1·99*<br>e.g. *£34·59 – £19·95*<br>Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction<br>e.g. *£10 – £3·45*<br>e.g. *1000 – 782*<br>Recognise fraction complements to 1 and to the next whole number<br>e.g. *$1\ ^{2}/_{5} + {}^{3}/_{5} = 2$* | Begin to subtract related fractions using equivalences<br>e.g. $^{1}/_{2} - {}^{1}/_{6} = {}^{2}/_{6}$<br>Use complementary addition for subtractions where the larger number is a multiple or near<br>  | |
| ***Y5*** **×** | Know by heart all the multiplication facts up to 12 × 12<br>Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000<br>Use knowledge of factors and multiples in multiplication<br>e.g. *43 × 6 is double 43 × 3*<br>e.g. *28 × 50 is $^{1}/_{2}$ of 28 × 100 = 1400*<br>Use knowledge of place value and rounding in mental multiplication<br>e.g. *67 × 199 as 67 × 200 – 67*<br>Use doubling and halving as a strategy in mental multiplication<br>e.g. *58 × 5 is half of 58 × 10*<br>e.g. *34 × 4 is 34 doubled twice*<br>Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally<br>e.g. *6 × 27 as 6 × 20 (120) plus 6 × 7 (42)*<br>e.g. *6·3 × 7 as 6 × 7 (42) plus 0·3 × 7 (2·1)*<br>Double amounts of money by partitioning<br>e.g. *£37·45 doubled is £37 doubled (£74) plus 45p doubled (90p) giving a total of £74·90* | Use short multiplication to multiply a 1-digit number by a number with up to 4 digits<br>  <br>Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20<br>Choose the most efficient method in any given situation<br>Find simple percentages of amounts<br>e.g. *10%, 5%, 20%, 15% and 50%*<br>Begin to multiply fractions and mixed numbers by whole numbers ≤ 10<br>e.g. *$4 \times {}^{2}/_{3} = {}^{8}/_{3} = 2\ ^{2}/_{3}$*<br>  | Know multiplication tables to 11 × 11<br>Multiply whole numbers and 1-place decimals by 10, 100 and 1000<br>Use knowledge of factors as aids to mental multiplication<br>e.g. *13 × 6 is double 13 × 3*<br>e.g. *23 × 5 is $^{1}/_{2}$ of 23 × 10*<br>Use the grid method to multiply numbers with up to 4 digits by 1-digit numbers<br>Use the grid method to multiply 2-digit numbers by 2-digit numbers |

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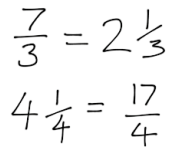
| **Y5**<br>**÷** | Know by heart all the division facts up to 144 ÷ 12<br>Divide whole numbers by 10, 100, 1000, 10 000 to give whole number answers or answers with 1, 2 or 3 decimal places<br>Use doubling and halving as mental division strategies<br>e.g. *34 ÷ 5 is (34 ÷ 10) × 2*<br>Use knowledge of multiples and factors, as well as tests for divisibility, in mental division<br>e.g. *246 ÷ 6 is 123 ÷ 3*<br>e.g. *We know that 525 divides by 25 and by 3*<br>Halve amounts of money by partitioning<br>e.g. *$^1/_2$ of £75·40 = $^1/_2$ of £75 (£37·50) plus half of 40p (20p) which is £37·70*<br>Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate<br>e.g. *96 ÷ 6 is 10 + 6, as 10 × 6 = 60 and 6 × 6 = 36*<br>e.g. *312 ÷ 3 is 100 + 4 as 100 × 3 = 300 and 4 × 3 = 12*<br>Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25<br>Know square numbers and cube numbers<br>Reduce fractions to their simplest form | Use short division to divide a number with up to 4 digits by a number ≤ 12<br>  <br>Give remainders as whole numbers or as fractions<br>Find non-unit fractions of large amounts<br>Turn improper fractions into mixed numbers and vice versa<br>  <br>Choose the most efficient method in any given situation | Know by heart division facts up to 121 ÷ 11<br>Divide whole numbers by 10, 100 or 1000 to give answers with up to 1 decimal place<br>Use doubling and halving as mental division strategies<br>Use an efficient written method to divide numbers ≤ 1000 by 1-digit numbers<br>Find unit fractions of 2- and 3-digit numbers |

| Year 6 | | | |
|---|---|---|---|
| | **Mental calculation** | **Written calculation** | **Default for ALL children** |
| ***Y6 +*** | Know by heart number bonds to 100 and use these to derive related facts<br>e.g. *3·46 + 0·54*<br>Derive, quickly and without difficulty, number bonds to 1000<br>Add small and large whole numbers where the use of place value or number facts makes the calculation do-able mentally<br>e.g. *34 000 + 8000*<br>Add multiples of powers of 10 and near multiples of the same<br>e.g. *6345 + 199*<br>Add negative numbers in a context such as temperature where the numbers make sense<br>Add two 1-place decimal numbers or two 2-place decimal numbers less than 1<br>e.g. *4·5 + 6·3*<br>e.g. *0·74 + 0·33*<br>Add positive numbers to negative numbers<br>e.g. *Calculate a rise in temperature or continue a sequence beginning with a negative number* | Use column addition to add numbers with up to 5 digits<br>£14·64<br>£28·78<br>£12·26 +<br>£55·68<br>11·1<br>Use column addition to add decimal numbers with up to 3 decimal places<br>Add mixed numbers and fractions with different denominators | Derive, swiftly and without difficulty, number bonds to 100<br>Use place value and number facts to add 'friendly' large or decimal numbers<br>e.g. *3·4 + 6·6*<br>e.g. *26 000 + 54 000*<br>Use column addition to add numbers with up to 4-digits<br>Use column addition to add pairs of 2-place decimal numbers<br>15·68<br>27·86 +<br>43·54<br>11·1 |
| ***Y6 –*** | Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition<br>e.g. *1000 – 654 as 46 + 300 in our heads*<br>Use number bonds to 1 and 10 to perform mental subtraction of any pair of 1-place or 2-place decimal numbers using complementary addition and including money<br>e.g. *10 – 3·65 as 0·35 + 6*<br>e.g. *£50 – £34·29 as 71p + £15*<br>Use number facts and place value to perform mental | Use column subtraction to subtract numbers with up to 6 digits<br>2 14 7 15<br>~~3~~ ~~4~~ 6 ~~8~~ ~~5~~<br>1 6 4 5 8 –<br>1 8 2 2 7 | Use number bonds to 100 to perform mental subtraction of numbers up to 1000 by complementary addition<br>e.g. *1000 – 654 as 46 + 300 in our heads*<br>Use complementary addition for subtraction of integers up to 10 000<br>e.g. *2504 – 1878*<br>Use complementary addition for subtractions of 1-place decimal numbers and amounts of money |

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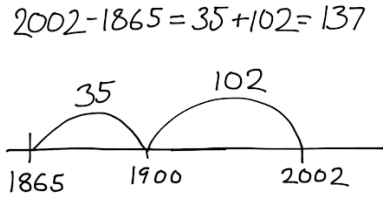
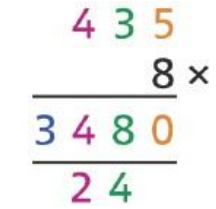
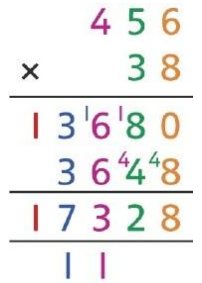
| | subtraction of large numbers or decimal numbers with up to 2 places<br>e.g. *467 900 – 3005*<br>e.g. *4·63 – 1·02*<br>Subtract multiples of powers of 10 and near multiples of the same<br>Subtract negative numbers in a context such as temperature where the numbers make sense | Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000<br>  <br>Use complementary addition for subtractions of decimal numbers with up to 3 places, including money<br>Subtract mixed numbers and fractions with different denominators | e.g. *£7·30 – £3·55* |
| ***Y6*** <br>**×** | Know by heart all the multiplication facts up to 12 × 12<br>Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000 e.g. *234 × 1000 = 234 000*<br>Identify common factors, common multiples and prime numbers and use factors in mental multiplication<br>e.g. *326 × 6 is 652 × 3 which is 1956*<br>Use place value and number facts in mental multiplication<br>e.g. *4000 × 6 = 24 000* e.g. *0·03 × 6 = 0·18*<br>Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25<br>e.g. *28 × 25 is a quarter of 28 × 100 = 700*<br>Use rounding in mental multiplication<br>e.g. *34 × 19 as (34 × 20) – 34*<br>Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning<br>e.g. *3·6 × 4 is 12 + 2·4* e.g. *2·53 × 3 is 6 + 1·5 + 0·09*<br>Double decimal numbers with up to 2 places using partitioning<br>e.g. *36·73 doubled is double 36 (72) plus double 0·73 (1·46)* | Use short multiplication to multiply a 1-digit number by a number with up to 4 digits<br>Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money<br>  <br>Use long multiplication to multiply a 2-digit number by a number with up to 4 digits<br>  <br>Multiply fractions and mixed numbers by whole numbers<br>Multiply fractions by proper fractions<br>Use percentages for comparison and calculate simple percentages | Know by heart all the multiplication facts up to<br>12 × 12<br>Multiply whole numbers and 1- and 2-place decimals by 10, 100 and 1000<br>Use an efficient written method to multiply a<br>1-digit or a teen number by a number with up to 4 digits by partitioning (grid method)<br>Multiply a 1-place decimal number up to 10 by a number ≤ 100 using the grid method |

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|---|---|---|---|
| **Y6**<br>**÷** | Know by heart all the division facts up to<br>144 ÷ 12<br>Divide whole numbers by powers of 10 to give whole number answers or answers with up to<br>3 decimal places<br>Identify common factors, common multiples and primes numbers and use factors in mental division<br>e.g. *438 ÷ 6 is 219 ÷ 3 which is 73*<br>Use tests for divisibility to aid mental calculation<br>Use doubling and halving as mental division strategies, for example to divide by 2, 4, 8, 5, 20 and 25<br>e.g. *628 ÷ 8 is halved three times:*<br>*314, 157, 78·5*<br>Divide 1- and 2-place decimals by numbers up to and including 10 using place value<br>e.g. *2·4 ÷ 6 = 0·4*<br>e.g. *0·65 ÷ 5 = 0·13*<br>e.g. *£6·33 ÷ 3 = £2·11*<br>Halve decimal numbers with up to 2 places using partitioning<br>e.g. *Half of 36·86 is half of 36 (18) plus half of 0·86 (0·43)*<br>Know and use equivalence between simple fractions, decimals and percentages, including in different contexts<br>Recognise a given ratio and reduce a given ratio to its lowest terms | Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number<br>4 6 r 1<br>3 ) 1 3 19<br>Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers<br>e.g. *4176 ÷ 13*<br>300 + 20 + 1, r 3<br>13 ) 4176<br>−3900<br>276<br>−260<br>16<br>−13<br>3<br>4176 ÷ 13 = 321 r 3<br>Give remainders as whole numbers or as fractions or as decimals<br>Divide a 1-place or a 2-place decimal number by a number ≤ 12 using multiples of the divisors<br>Divide proper fractions by whole numbers | Know by heart all the division facts up to<br>144 ÷ 12<br>Divide whole numbers by 10, 100, 1000 to give whole number answers or answers with up to<br>2 decimal places<br>Use an efficient written method, involving subtracting powers of 10 times the divisor, to divide any number of up to 1000 by a number ≤ 12<br>e.g. *836 ÷ 11 as 836 – 770 (70 × 11) leaving 66 which is 6 × 11, giving the answer 76*<br>Divide a 1-place decimal by a number ≤ 10 using place value and knowledge of division facts |