



KS1

Addition and subtraction

- Focus on number bonds, first with practical apparatus and followed with memorisation.
- Use number bonds knowledge to add several one digit numbers and to add/subtract a one digit number to/from a 2 digit number.
- Important skills is to add/subtract 1 and 10, which leads onto adding/subtracting multiples of 10 and adding/subtracting pairs of two digit numbers.

Multiplication and division

- Counting in 2s, 3s, 5s and 10s and relating this to repeated addition and the associated times tables.
- Practical activities involving repeated addition and arrays and using the language of 'how many groups of' will introduce them to division.
- Doubling and halving.

Fractions

- As numbers and operators, specifically in relation to halves, quarters and thirds.

Year 1		
	Mental calculation	Written calculation
+/ -	<p>Number bonds (story of 5, 6, 7, 8, 9 and 10).</p> <p>Count on/back in/from 1s from a given 2 digit number.</p> <p>Add/subtract two 1-digit numbers.</p> <p>Add three 1- digit numbers, spotting doubles or pairs to 10.</p> <p>Count on/back in 10s from any given 2- digit number.</p> <p>Add/subtract 10 to/from any given 2- digit number.</p> <p>Use number facts to add/subtract 1 - digit numbers to/from 2 - digit numbers, e.g. use $4 + 3$ to work out $24 + 3$, $34 + 3$ and $7 - 2$ to work out $27 - 2$.</p> <p>Add by putting the larger number first.</p>	
x/÷	<p>Begin to count in 2s, 5s and 10s.</p> <p>Begin to say what three 5s are by counting in 5s, or what four 2s are by</p>	

	<p>counting in 2s etc. Double numbers to 10. Find half of even numbers to 12 and know it is hard to halve odd numbers. Find half of even numbers by sharing. Begin to use visual and concrete arrays or 'sets of' to find how many sets of smaller number make a larger number.</p>	
Year 2		
	Mental calculation	Written calculation
+/-	<p>Number bonds - know all the pairs of numbers which make all the numbers to 12 and pairs with a total of 20. Count on/back in 1s and 10s from any given 2-digit number. Add two or three 1-digit numbers. Add/subtract a 1-digit number to/from any 2 digit number using number facts, including bridging multiples of 10, e.g. $45 + 4$, $38 + 7$, $56 - 3$, $53 - 5$. Add/subtract 10 and small multiples of 10 to/from any given 2 digit number. Add/subtract any pairs of 2 digit numbers by counting on/back in 10s and 1s or by counting up.</p>	
x/÷	<p>Count in 2s, 5s and 10s and begin to count in 3s. Begin to understand that multiplication is repeated addition and to use arrays, e.g. 3×4 is three rows of 4 dots. Begin to learn the 2, 3, 5 and 10 times tables, seeing these as 'lots of', e.g. 5 lots of 2, 6 lots of 2. Using fingers, say where a given number is in the 2s, 5s or 10s count, e.g. 8 is the fourth number when I count in 2s. Relate division to grouping, e.g. how many groups of 5 are in 15? Double and halve numbers up to 20. Begin to double multiples of 5 to 100. Begin to double 2 digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5.</p>	

	<p>Begin to halve numbers to 40 and multiples of 10 to 100.</p> <p>Find $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{3}{4}$ of a quantity of objects and of amounts (whole number answers).</p>	
--	---	--

Lower key stage 2

Addition and subtraction

- Use place value and number facts to add and subtract numbers mentally. Develop strategies to discard the 'counting in 1s' or finger based methods.
- Add and subtract multiples and near multiples of 10, 100 and 1000.
- Use complementary addition to find answers to 3 digit subtractions.
- Expanded and compact vertical method for work with larger numbers.

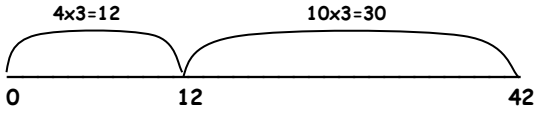
Multiplication and division

- All multiplication and division facts are memorised, including all facts up to 12×12 .
- Efficient written methods for multiplying or dividing a 2 or 3 digit number by a 1 digit number.
- Mental strategies for multiplication and division with large but 'friendly' numbers.

Fractions and decimals

- Reduce fractions to their simplest form.
- Find non-unit fractions of amounts and quantities.
- Decimal numbers are introduced and work with 1 place decimals.
- Multiplying and dividing whole numbers by 10 and 100.

Year 3		
+/-	<p>Number bonds - know number stories for numbers to 20.</p> <p>Know pairs of multiples of 10 with a total of 100.</p> <p>Add/subtract any two 2-digit numbers by counting on/back in 10s and 1s or by using partitioning.</p> <p>Add/subtract multiples and near multiples of 10 and 100.</p> <p>Perform place-value additions/subtractions without a struggle, e.g. $300 + 8 + 50 = 358$.</p> <p>Use place value and number facts to add a 1-digit or 2- digit number to a 3-digit number, e.g. $104 + 56$ is 160 since $104 + 50 = 154$ and $6 + 4 = 10$.</p>	<p>Use the expanded vertical method to add two or three 3-digit numbers or three 2-digit numbers.</p> $\begin{array}{r} 26 + 35 = 61 \\ \begin{array}{r} 20 + 6 \\ + 30 + 5 \\ \hline 60 + 1 \end{array} \end{array}$ <p>Use the expanded vertical method to subtract 2 and 3 digit numbers.</p> $\begin{array}{r} 75 - 48 = 27 \\ \begin{array}{r} 60 \\ 70 + 15 \\ - 40 + 8 \\ \hline 20 + 7 \end{array} \end{array}$ <p>Begin to use the compact vertical method to add/subtract numbers with</p>

	<p>Add pairs of 'friendly' 3-digit numbers, e.g. $320 + 450$.</p> <p>Subtract 2-digit numbers from numbers > 100 by counting up, e.g. $143 - 76$ is done by starting at 76, adding 4 (80), then adding 20(100), then adding 43, making the difference a total of 67.</p> <p>Subtract, when appropriate, by counting back or taking away, using place value and number facts.</p> <p>Begin to add amounts of money using partitioning. Find change from £1, £5 and £10.</p>	<p>three digits.</p> $\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \hline 11 \end{array}$ $\begin{array}{r} 874 \\ - 523 \\ \hline 351 \\ \hline \end{array}$ <p>Begin to add/subtract like fractions. Recognise fractions that add up to 1.</p>																								
<p>x/÷</p>	<p>Know by heart all the multiplication and corresponding division facts in the 2, 3, 4, 5, 8 and 10 times tables.</p> <p>Multiply and divide whole numbers by 10 and 100.</p> <p>Recognise that multiplication is commutative and that division is not. Use place value and number facts in mental multiplication and division, e.g. $30 \times 5 = 15 \times 10$, $84 \div 4$ is half of 42.</p> <p>Partition tens numbers to multiply by a 1-digit number, e.g. 3×14 as 3×10 and 3×4.</p> <p>Double numbers up to 50.</p> <p>Halve even numbers to 100, halve odd numbers to 20.</p> <p>Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders, e.g. $57 \div 3$ is $10 + 9$ as $10 \times 3 = 30$ and $9 \times 3 = 27$.</p>	<p>Use partitioning (grid method) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers.</p> $123 \times 5 = 615$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td></td><td>H</td><td>T</td><td>U</td></tr> <tr><td>x</td><td></td><td></td><td>5</td></tr> <tr><td>100</td><td>5</td><td>0</td><td>0</td></tr> <tr><td>20</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>3</td><td></td><td>1</td><td>5</td></tr> <tr><td></td><td>6</td><td>1</td><td>5</td></tr> </table> <p>Perform divisions just above the 10th multiple using a number line or chunking and understand how to give a remainder as a whole number.</p> $42 \div 3 = 14$  $\begin{array}{r} 42 \\ - 30 \quad (10 \times 3) \\ \hline 12 \\ - 12 \quad (4 \times 3) \\ \hline 0 \end{array}$ <p>Find unit fractions of quantities and begin to find non-unit fractions of quantities.</p> <p>Begin to use short multiplication and short division (bus stop).</p> $\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$ $7 \overline{) 98} \begin{array}{r} 14 \\ 2 \end{array}$		H	T	U	x			5	100	5	0	0	20	1	0	0	3		1	5		6	1	5
	H	T	U																							
x			5																							
100	5	0	0																							
20	1	0	0																							
3		1	5																							
	6	1	5																							

Year 4

	<p>Add/subtract any two 2-digit numbers by partitioning or counting on/back. Know by heart/quickly derive number bonds to 100 and £1.</p> <p>Add to the next 100, £1 and whole number, e.g. $3.4 + 0.6 = 4$.</p> <p>Perform place value additions/subtractions without a struggle, e.g. $4736 - 706 = 4030$.</p> <p>Add/subtract multiples and near multiples of 10, 100 and 1000.</p> <p>Add/subtract £1, 10p and 1p to amounts of money.</p> <p>+/- Use place value and number facts to add/subtract 1, 2, 3 and 4 digit numbers where a mental calculation is appropriate, e.g. $4004 + 156$ by knowing that $6 + 4 = 10$ and that $4004 + 150 = 4154$ so the total is 4160.</p> <p>Find change from £10, £20 and £50.</p> <p>Use complementary addition to subtract amounts of money, and for subtractions where the large number is a near multiple of 1000 or 100.</p> <p>Subtract by counting up, e.g. $503 - 368$ is done by adding $368 + 2 + 30 + 100 + 3$ (so we added 135).</p>	<p>Use the compact vertical method for addition/subtraction using 3 and 4-digit numbers.</p> $\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \small{1 \quad 1} \end{array}$ $\begin{array}{r} 8 \quad 12 \quad 1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$ <p>Add and subtract like fractions.</p> <p>Be confident with fractions that add up to 1 and fraction complements to 1.</p>																								
<p>x/÷</p>	<p>Know by heart all the multiplication facts up to 12×12 and the corresponding division facts.</p> <p>Recognise factors up to 12 of 2 digit numbers.</p> <p>Multiply and divide whole numbers and one place decimals by 10, 100 and 1000.</p> <p>Multiply multiples of 10, 100 and 1000 by 1-digit numbers, e.g. 300×6.</p> <p>Divide multiples of 100 by 1-digit numbers using division facts.</p> <p>Use understanding of place value and number facts in mental multiplication and division, e.g. 36×5 is half of 36×10 and $50 \times 60 = 3000$. $245 \div 20$ is half</p>	<p>Use short multiplication to multiply a 1-digit number by a 3-digit number.</p> $\begin{array}{r} 342 \\ \times \quad 7 \\ \hline 2394 \\ \small{2 \quad 1} \end{array}$ <p>Use the grid method to multiply a 2-digit number by a number between 10 and 20 by partitioning.</p> <p>$23 \times 12 = 276$</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">x</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;"> </td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">20</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="padding: 2px;">3</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">6</td> <td style="padding: 2px;">3</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;">276</td> </tr> </table> <p>Use short division (bus stop) to divide a 2-digit or a 3-digit number by a 1-digit</p>	x	1	0	2			20	2	0	0	4	0	3	3	0	6	3	6						276
x	1	0	2																							
20	2	0	0	4	0																					
3	3	0	6	3	6																					
					276																					

	<p>of $245 \div 10$.</p> <p>Partition 2-digit numbers to multiply by a 1-digit number mentally, e.g. 4×24 as 4×20 and 4×4.</p> <p>Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate, e.g. $156 \div 6$ is $20 \div 6$ as $20 \times 6 = 120$ and $6 \times 6 = 36$.</p> <p>Multiply near multiples by rounding, e.g. 33×19 as $(33 \times 20) - 33$.</p> <p>Find doubles to double 100 and beyond using partitioning.</p> <p>Find halves of even numbers to 200 and beyond using partitioning.</p> <p>Begin to double/halve amounts of money, e.g. £35.60 doubled is £71.20, half of £52.40 is £26.20.</p>	<p>number.</p> $\begin{array}{r} 86r2 \\ 5 \overline{) 432} \end{array}$ <p>Give remainders as whole numbers.</p> <p>Begin to reduce fractions to their simplest forms.</p> <p>Find unit and non-unit fractions of larger amounts.</p>
--	---	--

Upper key stage 2

Addition and subtraction

- Consolidate use of written methods when 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.
- Addition and subtraction of negative numbers.

Multiplication and division

- Efficient and flexible strategies for mental multiplication and division are taught and practised.
- Extension of knowledge in using written algorithms for multiplication and division.

Fractions, decimals, percentages and ratio

- Fractions and decimals are added, subtracted multiplied and divided.
- Calculate simple percentages and ratios.

Year 5		
+/-	<p>Know number bonds to 1 and to the next whole number.</p> <p>Add to the next 10 from a decimal number, e.g. $13.6 + 6.4 = 20$.</p> <p>Add/subtract numbers with 2</p>	<p>Use the compact vertical method to add/subtract numbers with up to 5 digits.</p>

	<p>significant digits only, using mental strategies, e.g. $3.4 + 4.8$, $23\ 000 + 47\ 000$.</p> <p>Add/subtract 1 or 2 digit multiples of 10, 100, 1000, 10 000 and 100 000.</p> <p>Add/subtract near multiples of 10, 100, 1000, 10 000 and 100 000 to/from other numbers, e.g. $82\ 472 - 30\ 004$.</p> <p>Add/subtract decimal numbers which are near multiples of 1 or 10, including money, e.g. $6.34 + 1.99$.</p> <p>Use place value and number facts to add two or more 'friendly' numbers, including money and decimals, e.g. $0.6 + 0.7 + 0.4$.</p> <p>Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction, e.g. $£10 - £3.45$.</p> <p>Recognise fraction compliments to 1 and to the next whole number.</p> <p>Use complementary addition for subtractions where the larger number is a multiple or near multiple of 100.</p> <p>Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money.</p>	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $\begin{array}{r} 7\ 8\ 9 \\ +\ 6\ 4\ 2 \\ \hline 1\ 4\ 3\ 1 \\ 1\ 1 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} \\ \\ -\ 4\ 5\ 7 \\ \hline 4\ 7\ 5 \end{array}$ </div> </div> <p>Use the compact vertical method to add any pair of 2-place decimal numbers, including amounts of money.</p> <p>Begin to add/subtract related fractions using equivalences.</p> <p>Choose the most efficient method in any given situation.</p>
\times/\div	<p>Know by heart all multiplication facts up to 12×12 and the corresponding division facts.</p> <p>Multiply whole numbers and 1 and 2 place decimals by 10, 100, 1000, 10 000.</p> <p>Divide whole numbers by 10, 100, 1000, 10 000 to give whole number answers or answers with 1, 2 or 3 decimal places.</p> <p>Use knowledge of place value and rounding in mental multiplication, e.g. 67×199 as $67 \times 200 - 67$.</p> <p>Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally, e.g. 6.3×7 as 6×7 (42) plus</p>	<p>Use short multiplication to multiply a 1-digit number by a number with up to 4 digits.</p> <div style="text-align: center;"> $\begin{array}{r} 2\ 7\ 4\ 1 \\ \times 6 \\ \hline 1\ 6\ 4\ 4\ 6 \\ 4\ 2 \end{array}$ </div> <p>Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20.</p>

	<p>0.3×7 (2.1).</p> <p>Double/halve amounts of money by partitioning.</p> <p>Use doubling and halving as a strategy in mental multiplication and division, e.g. 34×4 is 34 doubled twice.</p> <p>Use knowledge of multiples and factors, as well as tests for divisibility, in mental division, e.g. 28×50 is $\frac{1}{2}$ of $28 \times 100 = 1400$, $246 \div 6$ is $123 \div 3$.</p> <p>Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate, e.g. $96 \div 3$ is $100 + 4$ as $100 \times 3 = 300$ and $4 \times 3 = 12$.</p> <p>Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25.</p> <p>Know square numbers and cube numbers.</p> <p>Reduce fractions to their simplest form.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 2 \\ 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 12 \\ 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline 11 \end{array}$ </div> </div> <p>Use short division (bus stop) to divide a number with up to 4 digits by a number less than or equal to 12.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{)432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{)496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$ <p>Answer: $45\frac{1}{11}$</p> </div> </div> <p>Give remainders as whole numbers or as fractions.</p> <p>Find non-unit fractions of large amounts.</p> <p>Turn improper fractions into mixed numbers and vice versa.</p> <p>Find simple percentages of amounts.</p> <p>Begin to multiply fractions and mixed numbers by whole numbers less than or equal to 10.</p> <p>Choose the most efficient method in any given situation.</p>
--	---	---

Year 6

<p>+/-</p>	<p>Know by heart number bonds to 100 and use these to derive related facts, e.g. $3.46 + 0.54$.</p> <p>Derive, quickly and without difficulty, number bonds to 1000.</p> <p>Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition.</p> <p>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, e.g. $1000 - 654$ as $46 + 300$ in our heads, $10 - 3.65$ as $0.35 + 6$.</p> <p>Add small and large whole numbers where the use of place value or number</p>	<p>Use the compact vertical method to add/subtract numbers with up to 6 digits.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \hline 11 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 8 1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$ </div> </div> <p>Use the compact vertical method to add decimal numbers with up to 3 decimal places.</p> <p>Add/subtract mixed numbers and fractions with different denominators.</p>
------------	--	--

	<p>facts make the calculation do-able mentally, e.g. $34000 + 8000$.</p> <p>Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places.</p> <p>Add/subtract multiples of powers of 10 and near multiples of the same, e.g. $6345 + 199$.</p> <p>Add/subtract negative numbers in a context such as temperature where the numbers make sense.</p> <p>Add two 1-place decimal numbers or two 2-place decimal numbers less than 1, e.g. $0.74 + 0.33$.</p> <p>Add positive numbers to negative numbers.</p> <p>Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000.</p> <p>Use complementary addition for subtractions of decimal numbers with up to 3 places, including money.</p>	
x/÷	<p>Know by heart all the multiplication facts up to 12×12 and the corresponding division facts.</p> <p>Multiply/divide whole numbers and decimals with up to 3 places by 10, 100 or 1000.</p> <p>Identify common factors, common multiples and prime numbers and use factors in mental multiplication and division, e.g. $438 \div 6$ is $219 \div 3$ which is 73.</p> <p>Use place value and number facts in mental multiplication, e.g. $0.03 \times 6 = 0.18$.</p> <p>Use tests for divisibility to aid mental calculation.</p> <p>Use doubling and halving as mental multiplication/division strategies,</p>	<p>Use short multiplication to multiply a 1-digit number by a number with up to 4 digits.</p> $\begin{array}{r} 2741 \\ \times \quad 6 \\ \hline 16446 \\ \hline 42 \end{array}$ <p>Use long multiplication to multiply a 2-digit number by a number with up to 4 digits.</p> $\begin{array}{r} 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline 11 \end{array}$ <p>Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money.</p>

including to multiply/divide by 2, 4, 8, 5, 20, 50 and 25, e.g. 28 x 25 is a quarter of 28 x 100 = 700.

Use rounding in mental multiplication, e.g. $34 \times 19 \approx (34 \times 20) - 34$.

Multiply/divide 1 and 2-place decimals by numbers up to and including 10 using place value and partitioning, e.g. 3.6×4 is $12 + 2.4$.

Double/halve decimal numbers with up to 2 places using partitioning.

Know and use equivalence between simple fractions, decimals and percentages, including in different contexts.

Recognise a given ratio and reduce a given ratio to its lowest terms.

Multiply fractions and mixed numbers by whole numbers.

Multiply fractions by proper fractions.

Use percentages for comparison and calculate simple percentages.

Use short division (bus stop) to divide a number with up to 4 digits by a 1-digit or a 2-digit number.

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \end{array}$$

Answer: $45\frac{1}{11}$

Use long division to divide 3-digit and 4-digit numbers by friendly 2-digit numbers.

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Give remainders as whole numbers or as fractions or as decimals.

Divide a 1-place or a 2-place decimal number by a number less than or equal to 12 using multiples of the divisors.

Divide proper fractions by whole numbers.

September 2017 Update