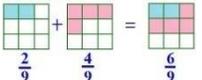
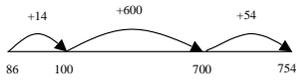
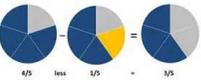


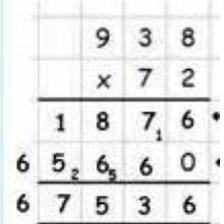
Addition

	Stage 3	Stage 4	Stage 5	Stage 6
National Curriculum 2014 Expectation	Add numbers with up to 3 digits Begin to add like fractions (e.g; $3/8 + 1/8$) Recognise fraction pairs that add to 1	Add numbers with up to 4 digits Add like fractions (e.g; $2/5+4/5=7/5= 1 2/5$) Be confident with fraction pairs that add to 1	Add numbers with more than 4 digits (including money,measures and decimals with different numbers of decimal places) Begin to add related fractions with equivalence	Add several numbers with increasing complexity Add mixed numbers and fractions with different denominators
Written Method	Number lines- efficient jumps Hundred squares Partitioned column method	Expanded column method	Columnar addition	Columnar addition
Steps in understanding	<p>55+37</p>  <p>243 + 351</p> $\begin{array}{r} 200 + 40 + 3 \\ + 300 + 50 + 1 \\ \hline 500 + 90 + 4 \end{array}$ 	<p>367</p> $\begin{array}{r} +185 \\ 12 \\ 140 \\ 400 \\ \hline 552 \end{array}$ <p>300 + 60 + 7 <u>100 + 80 + 5</u> 400 + 140 + 12 = 552</p> <p>Leading to</p> $\begin{array}{r} 367 \\ + 185 \\ \hline 552 \\ 11 \end{array}$ <p>$\frac{3}{7} + \frac{2}{7} = ?$</p> $\frac{3}{7} + \frac{2}{7} = \frac{3+2}{7} = \frac{5}{7}$ <p><small>fractions-math.blogspot.com</small></p>	<p>35.8+7.3</p>  <p>3587 <u>+ 675</u> 4262 1 1 1</p> <p>Adding fractions</p> $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$	<p>13.86 <u>+ 9.481</u> 23.341 1 1 1</p>
Mental Calculations (or with jottings)	Know pairs to make 20 Multiples of 10 to make 100 Add multiples and near multiples of 10 and 100 Place value additions(e.g.; $600+70+8=678$) Begin to add money by partitioning Use near doubles to add (e.g.; $16+17$) Mentally add 2 digit numbers	Add 2-digit numbers by partitioning Know number bonds to 100 and £1 Add to next hundred, pound and whole number Add multiples of 10/100/1000 Add £1,10p,1p to amounts of money Add by rounding and adjusting Use place value and number facts to add (e.g.; $4004+156$ by knowing $6+4=10$ and $4004+150=4154$)	Know number bonds to 1 Add multiples of 10/100/1000 and tenths Add numbers with two significant figures including decimals Adjust numbers to add (e.g.; $245+99$) Use place value and number facts to add two or more friendly numbers e.g; $0.6+0.7+0.4$ or $2,056+44$)	Add multiples of 10/100/1000/tenths/hundredths Know by heart number bonds to 100 and use for related facts (e.g.; $3.46+0.54=4$) Derive quickly numbers bonds to 1000 Add small or large numbers using place value (e.g.; $34,000+8000$) Add positive numbers to negative numbers(e.g.; temperature change)

Subtraction

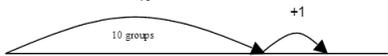
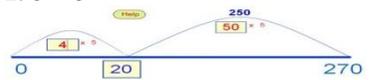
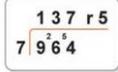
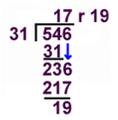
	Stage 3	Stage 4	Stage 5	Stage 6
National Curriculum 2014 Expectation	Subtracting with 2 and 3 digit numbers Begin to subtract like fractions (e.g.: $7/8 - 3/8$)	Subtract with up to 4-digit numbers Subtract like fractions Find fraction complements to 1 (e.g.: $1-2/3=1/3$)	Subtract with at least 4-digit numbers (including money, measures and decimals) Begin to subtract related fractions with equivalence	Subtracting with increasingly large and more complex numbers and decimal values Subtracting mixed numbers and fractions with different denominators
Written Method	Partitioning column method Number lines to count on	Partitioned column method Compact column method	Compact column subtraction with decomposition (exchanging)	Compact column method
What does this look like? Steps in understanding	<p>754-86</p>  	$\begin{array}{r} 7 \cancel{0} 5 \\ - 83 \\ \hline 48 \end{array} \quad \begin{array}{r} 5 \cancel{0} 3 \\ - 125 \\ \hline 138 \end{array}$ <p>$3/4 - 1/4 = 1/2$</p>	$\begin{array}{r} 804 \cancel{0} 13 \\ - 397 \\ \hline 6 \end{array} \quad \begin{array}{r} 7 \cancel{0} 9 \cancel{0} 14 \cancel{0} 13 \\ - 397 \\ \hline 7656 \end{array}$ <p>$6 - \frac{2}{7} =$ $\frac{3}{5} - \frac{1}{3} =$</p>	<p>Subtracting fractions</p> $\frac{2}{3} - \frac{1}{2} = \frac{1}{6}$ $\frac{3}{4} - \frac{2}{3} = \frac{1}{12}$ <hr style="width: 20%; margin-left: auto; margin-right: 0;"/> $\frac{3}{4} - \frac{1}{3} =$
Mental Calculations (or with jottings)	Know pairs which total 20 Subtract any 2 digit numbers Subtract 2-digit numbers from numbers >100 by counting up (e.g: 145-87 start counting on from 87) Subtract multipls and near multipls of 10/100 Find change from £1, £5 and £10	Subtract any 2-digit numbers Know by heart number bonds to 100 Perform place value subtractions (e.g: 4675-675) Subtract multiples and near multiples of 10/100/1000 Subtract by counting up Subtract £1, 10p, 1p from amount of money Find change from £10, £20 and £50	Subtract numbers with two significant digits Subtract multiples of 10/100/1000/tenths 2-digit - 2-digit including with decimals Difference between Adjust numbers to subtract (e.g: when -99.-49) Subtract decimal numbers which are near multiples of 1 and 10(e.g: 6.34-1.99)	Subtract multiples of 10/100/1000/tenths/hundredths 2-digit - 2-digit including with decimals Difference between Adjust numbers to subtract Use number bonds to 10 and 10 for mental calculations(e.g: 10-3.65) Subtract negatives in context of temperature

Multiplication

	Stage 3	Stage 4	Stage 5	Stage 6														
National Curriculum 2014 Expectation	Multiply 2 digits by a single digit number	Multiply 2 and 3 digits by a single digit using the formal written layout	Multiply up to 4 digits by 1 or 2 digits using a formal written method, including long multiplication for 2-digit numbers Begin to multiply fractions by whole numbers	Multiply decimals with up to 2 dp by a single digit Multiply fractions														
Written Method	Partitioning to multiply Introduction to grid method	Grid method Use partitioning to multiply 2-digit by 2-digit numbers Short multiplication for TUxU	Short multiplication (for TUxU) Long multiplication for TUxTU	Short and long multiplication methods														
Steps in understanding	<p>Partitioning</p> $47 \times 6 = 282$ $47 \times 6 = (40 \times 6) + (7 \times 6) = 282$	<p>Grid method leading to formal written method</p> <p>35x7 by partitioning</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p style="text-align: center;">$210 + 35 = 245$</p> <p>Short multiplication</p> $\begin{array}{r} 35 \\ \times 7 \\ \hline 245 \\ 3 \end{array}$	x	30	5	7	210	35	<p>Grid method linked to formal written method</p> <p>$613 \times 5 =$</p> <p>We partition 613 into 600 and 10 and 3 and put it in a table.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>600</td> <td>10</td> <td>3</td> </tr> <tr> <td>5</td> <td>3000</td> <td>50</td> <td>15</td> </tr> </table> <p style="text-align: center;"><small>Add up 3000, 50 and 15 to make 3065.</small></p> <p style="text-align: right;">$613 \times 5 = 3065$</p> <p>Leading to :</p> <p>Long multiplication</p> $\begin{array}{r} 286 \\ \times 29 \\ \hline 2574 \\ 5720 \\ \hline 8294 \\ 1 \end{array}$ <p style="margin-left: 100px;">$(9 \times 286 = 2574)$ $(20 \times 286 = 5720)$</p>	x	600	10	3	5	3000	50	15	 <p style="text-align: center;">0.58</p> $\begin{array}{r} 0.58 \\ \times 4 \\ \hline 232 \end{array}$
x	30	5																
7	210	35																
x	600	10	3															
5	3000	50	15															
Mental Calculations	<p>Know by heart 2x,3x,4x,5x,8x,10x tables</p> <p>Multiply whole numbers by 10 and 100</p> <p>Double numbers up to 50</p> <p>Partitioning numbers (e.g. calculate 3×14 as 3×10 and 3×4)</p>	<p>Know 2x,3x,4x,5x,6x,8x,10x tables</p> <p>Recognise factors up to 12 of 2-digit numbers</p> <p>Multiply multiples of 10/100/1000 by a single digit</p> <p>Find doubles to 100 and beyond by partitioning</p> <p>Beginning to double money</p> <p>Use known facts in mental calculations (e.g.; for 42×5 use 42×10 and halve it)</p> <p>Partition 2-digit numbers (for 74×6 calculate 70×6 and 4×6)</p>	<p>Know by heart all multiplication facts up to 12×12</p> <p>Double large numbers and decimals</p> <p>Partition to multiply mentally</p> <p>Multiply and divide numbers by 10/100/1000</p> <p>Identify multiples and factors, and common factors of two numbers</p> <p>Establish whether a number up to 100 is prime</p>	<p>Know by heart all multiplication facts up to 12×12</p> <p>Partition to multiply mentally</p> <p>Double large numbers and decimals</p> <p>Perform mental calculations, including with mixed operations and large numbers</p>														

Perton Middle

Division

	Stage 3	Stage 4	Stage 5	Stage 6
National Curriculum 2014 Expectation	Divide 2-digit numbers by a single digit (no remainder)	Divide up to 3-digit numbers by a single digit	Divide up to 4 digits by a single digit (including remainders) using the formal written method of short division Turn improper fractions into mixed numbers	Divide at least 4 digits by a single digit and 2 -digit number using the formal written and interpret remainders as appropriate for the context Divide proper fractions by whole numbers
Written Method	Grouping on a number line. Division by chunking. Short division(no remainders) Find unit fractions of quantities (e.g.: 1/3 of 27)	Short division (including remainders when ready) Give remainders as whole numbers Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts	Short division with remainders (bus stop method)	Short division. Introduce long division Divide a one-place decimal number by a number <12
Steps in understanding	<p>$30 \div 6$ can be modelled as: grouping – groups of 6 placed on no. line and the number of groups counted e.g.</p> 	<p>Grouping using partitioning e.g., $41 \div 4$ if I know $10 \times 4 = 40$</p>  <p>Chunking up on a number line $270 \div 5$</p> 	<p>Short Division</p> $5 \overline{) 847} \begin{matrix} 169 \\ \underline{50} \\ 34 \\ \underline{30} \\ 7 \end{matrix} \text{r } 2$ <p>Improper fraction to a mixed number</p> $\frac{12}{5} = 2\frac{2}{5}$	<p>Short division</p>  <p>Long division $546 \div 31$</p> 
Mental Calculations	Know by hear all division facts from 2x,3x,4x,5x,8x,and 10x tables Divide whole numbers by 10 or 100 (whole number answers) Use place value and known facts (e.g: $64 \div 4$ is half of 32) Halve even numbers to 100, halve odd numbers to 20	Division facts from 2x,3x,4,x5x,6x,8x,10x tables Divide whole numbers by 10/100 Divide multiples of 100 by single digit(e.g.: $3600 \div 6 = 600$) Divide larger numbers by breaking into chunks ($156 \div 6$ as $20 \times 6 = 120$ and $6 \times 6 = 36$) Find halves of even numbers to 200 Begin to halve amounts of money (e.g.: Half of £64.20= £32.10)	Division facts from tables Divide whole numbers by 10/100/1000 including decimal answers Halve large numbers and decimals	Perform mental calculations, including with mixed operations and large numbers Partition to divide mentally Halve larger numbers and decimals