Counting and the 4 operations:

A step-by-step guide for families about Maths teaching at Barnham Primary School

<u>Counting, place value and mental methods of calculation</u>

End of year expectations	**What does this look like?**
<u>By the end of **Year R:**</u> I can verbally count to 20 and beyond.	Children can remember and recall in sequence the numbers from 0 to 20 in the correct order when asked to count. When this is secure, they will then count beyond 20, recognising the patterns of crossing a tens number, for example 19-20-21..29-30-31, knowing instinctively which 'tens' number (ie 30, 40) comes next in the sequence.
I can automatically recall number bonds to 5.	When asked, children can recognise and recall pairs of numbers that make 5, for example '2 and 3 makes 5' or '4 and 1 is 5 altogether.'
I can subitise.	Children can recognise small amounts of objects without needing to count the total.
I can count using reliably using 1:1 correspondence.	Children can count accurately, saying the number names in order and counting each object, groups of objects to 20.
<u>By the end of Year 1:</u> I can count to and across 100, forwards and backwards, from any given number.	Children can remember and recall in sequence the numbers from 0 to 100 in the correct order when asked to count. When this is secure, they will then count forwards or backwards from any given number, recognising the patterns 98, 99, 100, 101, 102 etc.
I can count, read and write numbers to 100 in numerals.	Children will learn about the place value of numbers and their place in the number system. They will use these in order to ensure numbers are correctly written. For example, forty-six is four tens and six ones, so is written 46 instead of 64.
I can, when given a number, identify one more or one less.	Children will start to learn about the place of numbers in a number line, so that they can quickly recall one more or less than any given number. Beginning with numbers to 20 then extending to 100, using number lines and number squares (or 100 squares) for support.
<u>By the end of Year 2:</u> I can use mental recall of addition and subtraction facts to 10.	Children will know, and quickly recall, number bonds to 10. ie: 1 + 9 = 10, 2 + 8 = 10, 3 + 7 = 10 etc Children will use knowledge that subtraction is the inverse of addition to recall subtraction facts to 10. ie: 1 + 9 = 10 so 10 – 1 = 9 or 10 – 9 = 1
I can recognise the place value of each digit in a 2-digit number	Children will understand the value of each number in a 2-digit number. For example, they will know that 37 is 3 tens and 7 ones, not a 3 and a 7.
I can identify, represent and estimate numbers using different representations	Children will use their knowledge of place value, as above, to read numbers and show their relative position on a number line. Children will also be able to estimate using their knowledge of number. Children will be able to represent numbers using different equipment, for examples tens and ones counters.
I can compare and order numbers from 0 to 100 using the < > and = symbols	Children can say which number is larger or which number is smaller. They can read the < and > symbols as < less than, > greater than and use these alongside the = equals symbol to compare and order numbers. For example: 7 < 9, 21 > 12 or 3 + 3 = 6
I can read and write numbers to at least 100 in numerals and words	Children will be able to read 2-digit numbers to 100. Children will be able to read numbers as words to 100, for example 21 as twenty one, 78 as seventy-eight.
<u>By the end of Year 3:</u> I can add and subtract two digit numbers mentally.	Children will use knowledge of the number line methods to count on/back in units, then 10s. Children will use knowledge of partitioning. (See written methods of addition and subtraction)
I can use mental recall of addition and subtraction facts to 20 in solving problems involving larger numbers.	Children will understand that: 14 + 6 = 20 So I know that 140 + 60 = 200 15 – 8 = 7 So I know that 150 – 80 = 70
I can derive associated division facts from known multiplication facts.	Children will use the knowledge that multiplication is the inverse of division: 5 x 4 = 20 So I know that 20 ÷ 4 = 5 or 20 ÷ 5 = 4
I can compare and order numbers up to 1000.	Children can say which number is larger or which number is smaller. They can read the < and > symbols as < less than, > greater than and use these alongside the = equals symbol to compare and order numbers. For example: 167 < 595, 219 > 123 or 300 + 300 = 600

I can read and write numbers to at least 1000 in numerals and words	Children will be able to read and write 3-digit numbers to 1000. Children will be able to read numbers as words to 1000, for example 121 as one hundred and twenty one, 78 as seventy-eight.
By the end of Year 4: I can recall multiplication facts up to 12x12 and quickly derive the corresponding division facts.	Children will learn multiplication tables by rote, not by counting on. ie: 1 x 2 = 2, 2 x 2 = 4, 3 x 6 = 6, 4 x 2 = 8 etc not: 2, 4, 6, 8 etc Learning by rote will significantly aid pupils' work in both multiplication and division. Children can derive division facts using knowledge that division is the inverse of multiplication for all times tables.
I can use a range of mental methods of computation for addition, subtraction, multiplication and division.	Addition/Subtraction: Children will use knowledge of the number line methods to count on/back. Children will use knowledge of partitioning and decimals. Children can use compensation to streamline calculations. E.g. 52+39; think of it as 52+40=92 then remove the 1 added at the beginning. Multiplication/Division: Children will learn multiplication tables by rote, not by counting on. Children will derive division facts using knowledge that division is the inverse of multiplication. Children will use knowledge of partitioning (and decimals) to multiply 2-digit numbers by 1-digit numbers. Children will use knowledge of the short division method to divide 2-digit numbers by 1-digit numbers.
I can compare and order numbers beyond 1000.	Children can say which number is larger or which number is smaller. They can read the < and > symbols as < less than, > greater than and use these alongside the = equals symbol to compare and order numbers. For example: 1167 < 595, 2019 > 123 or 3500 + 3500 = 7000 Children can compare numbers with the same number of decimal places, up to 2 decimal places (from fractions).
I can read and write Roman numerals.	Children can read Roman numeral to 100 (I to C). Children can understand that the Roman numeral system changed over time to include the concept of 0.
I can round numbers.	I can round any number to the nearest 10, 100 or 1000. I can round decimals with 1 decimal place to the nearest whole number (from fractions).
By the end of Year 5: I can round numbers.	I can round numbers to the nearest 10,000 and 100,000 I can round decimals to the nearest whole number and 1 decimal place
I can compare and order numbers to 1,000,000.	I can read, write, order and compare numbers to 1,000,000 I can determine the value of each digit in a 7-digit number I can recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents I can read Roman numerals to 1000.
By the end of Year 6: I can compare and order numbers beyond 1,000,000.	I can read, write, order and compare numbers up to 10,000,000 I can determine the value of each digit in an 8-digit number I can identify the value of each digit to three decimal places. I can compare and order fractions, percentages and decimals – understanding how to convert between the three when required.

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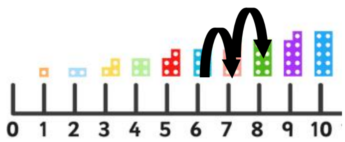
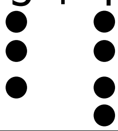
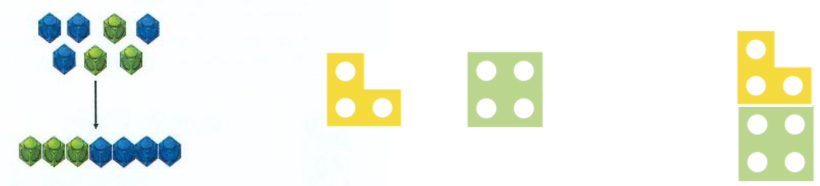
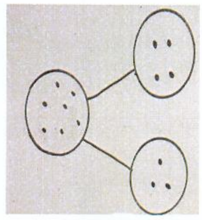
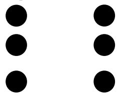
<u>Addition</u>

End of year expectations	**What does this look like?**
<u>By the end of **Year R:**</u> I can explore and represent patterns within numbers to 10, including odds & evens, doubling facts and quantities.	Children will be able to combine 2 groups of objects to solve a simple adding problem, for example when given 2 bears and 3 bears they will combine groups and count 5 in total. Children will begin to understanding odds and evens as numbers that can or cannot be shared equally between 2.
<u>By the end of Year 1:</u> I can add one-digit and two-digit numbers to 20, including zero	In practical activities, children can combine 2 or more groups of objects before providing a total. Children can understand the + and = signs and what they need to do when they see them. Children begin to use a number line to 20 to add 1 more, 2 more etc by jumping on from a given number. Children can record these as number sentences.  5 + 2 = 7
I can read, write and interpret mathematical statements involving + and = symbols	Children can read the symbol + as 'add, plus or altogether,' knowing what it means in practical terms. Children can read the symbol = and understand that is means both sides of a number sentences must be balanced, seen in different contexts. For example: 5 + 2 = 7 8 = 4 + 4 1 + 2 = 2 + 1
I can solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.	Children can use objects and diagrams to solve simple problems, ie 'I have 3 apples and 4 oranges. How many do I have altogether?' Children can draw a simple representation of dots showing each object then count the total. 3 + 4 = 7 
I can represent and use number bonds within 20	Children can investigate number bonds to 10, looking for patterns. Children then learn number bonds to 20 and how knowing bonds to 10 can support this, ie Children will understand that: 4 + 6 = 10 So I know that 14 + 6 = 20
<u>By the end of Year 2:</u> I can add numbers using objects, pictorial representation and mentally, including: 2 digits plus ones 2-digits plus 10s 2 digit plus 2-digit Adding three single digit numbers	Children can use the methods below to solve the following addition problems: 1 digit + 1 digit 2 digit + 1 digit 2 digit + 2 digit 1 digit + 1 digit + 1 digit Children can add two numbers by combining groups of objects, for example 3 + 4 = 

Children can solve additions by drawing a simple diagram or by knowing number facts (see number bonds previously).

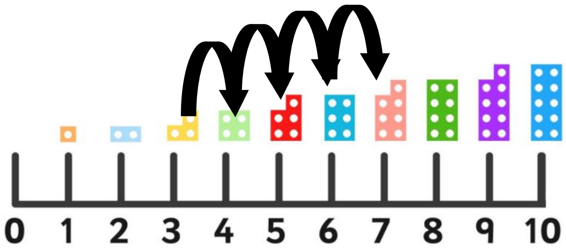


3 + 4 = 7

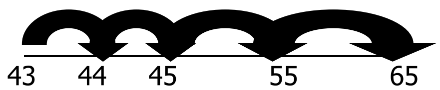


3			4			
1	1	1	1	1	1	1

Children can add two numbers using a printed number line: 3 + 4 = 7



Children can add two numbers using an empty number line
ie: 43 + 22 = 65



Children can begin to partition and add 2-digit numbers informally, for example

43 + 22
40 + 20 = 60
3 + 2 = 5
60 + 5 = 65

Children can add using a hundred square, for example

16 + 32 = 48

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

By the end of Year 3:
I can add 3-digit numbers using a written method. (These methods build on each other to develop understanding of the written methods leading to column addition.)

Partition method:

592 + 263 = 855

2 + 3 = 5
90 + 60 = 150
500 + 200 = 700

700 + 150 + 5 = 855

Expanded Column Addition 1 (no exchanging):

592 + 263 = 855

```
  500   90    2
+ 200   60    3
  700  150    5
```

Expanded Column Addition 2 (with exchanging):

592 + 263 = 855

```
  500   90    2
+ 200   60    3
  800   50    5
  100
```

Column Addition:

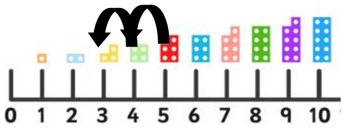
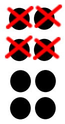
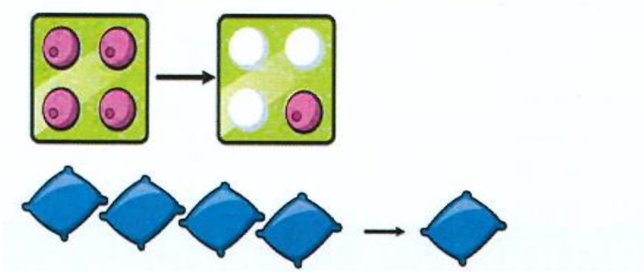
592 + 263 = 855

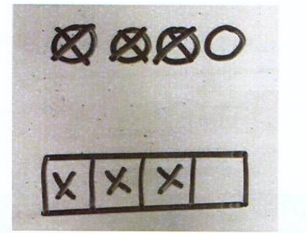
```
  5 9 2
+ 2 6 3
  8 5 5
  1
```

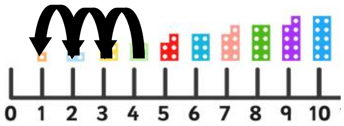
By the end of Year 4:
I can use an efficient written method of addition.
	Column Addition:
	
	1592 + 1263 = 2855
	
	  1 5 9 2
	+ 1 2 6 3
	  2 8 5 5
	     1	

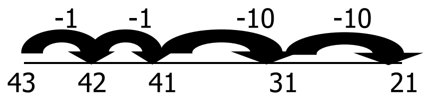
By the end of Year 5: I can use known facts, place value, knowledge of operations and brackets to calculate including all four operations with decimals to two places.	Column Addition: 846.73 + 478.98 = 1325.71 8 4 6. 7 3 + 4 7 8. 9 8 13 2 5. 7 1 1 1 1 1	
I can solve simple problems involving adding negative numbers in context.	Number Line Methods: Pupils use a number line to add numbers in a negative context. -5 + 4 = -1	The understanding that: +ve + +ve = + -ve + +ve = + +ve + -ve = - -ve + -ve = - ∴ -5 + -4 = -9 May be independently held or developed by pupils and they may wish to use this knowledge when carrying out calculations of this nature.
By the end of Year 6: I can add fractions by writing them with a common denominator.	$\frac{1}{2} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}$ $\frac{1\ (\times 2)}{2\ (\times 2)} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}$ When answering, fractions should always be simplified or given as a mixed number.	

Subtraction

End of year expectations	What does this look like?
By the end of **Year R:** I can explore and represent patterns within numbers to 10.	Children will be able to remove a given amount of objects from a larger group, for example when they will physically take away 5 bears from a larger group of 10 bears.
By the end of Year 1: I can subtract one-digit and two-digit numbers from 20, including zero	In practical activities, children can count and remove one groups of objects from another before counting the new total. Children can understand the - and = signs and what they need to do when they see them. Children begin to use a number line to 20 to find 1 less, 2 less etc. Children can record these as number sentences.  5 - 2 = 3
I can solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.	Children can use objects and diagrams to solve simple problems, ie 'I have 8 apples and I eat 4 of them. How many do I have left?' Children can draw a simple representation of dots showing each object then cross some out to calculate a new total. 8 - 4 = 3 
I can read, write and interpret mathematical statements involving - and = symbols	Children can read the symbol + as 'add, plus or altogether,' knowing what it means in practical terms. Children can read the symbol = and understand that is means both sides of a number sentences must be balanced, seen in different contexts. For example: 5 - 2 = 3 8 = 10 - 2 4 - 2 = 5 - 3
I can represent and use number bonds within 20	Children can investigate number bonds to 10, looking for patterns. Children then learn number bonds to 20 and how knowing bonds to 10 can support this, ie Children will understand that: If 5 + 5 = 10 Then I know that 10 – 5 = 5
By the end of Year 2: I can subtract numbers using objects, pictorial representation and mentally, including: 2 digits minus ones 2-digits minus 10s 2 digit minus 2-digit	Children can use the methods below to solve the following subtraction problems: 1 digit - 1 digit 2 digit - 1 digit 2 digit - 2 digit Children can subtract two numbers by physically taking away objects, for example 4 - 3 = 1 

<table>
<tr><td></td><td colspan="2">
Children can subtract using a simple diagram, for example:

4 - 3 = 1

Children can subtract using a printed number line:


4 - 3 = 1
Children can subtract using an empty number line:
43 - 22 = 21


Children can subtract using a hundred square, for example
99 – 88 = 11

</td></tr>
<tr><td rowspan="2">By the end of Year 3:
I can subtract 3-digit numbers using a written method.</td>
<td>
<u>Expanded Column Subtraction (no exchanging):</u>

645 - 232 = 413

600 40 5
- <u>200 30 2</u>
<u>400 10 3</u>
</td>
<td>
<u>Expanded Column Subtraction (with exchanging):</u>

721 - 556 = 165

600 110
~~700~~ ~~20~~ 11
- <u>500 50 6</u>
<u>100 60 5</u>
</td></tr>
<tr>
<td>
<u>Column Subtraction:</u>

645 - 231 = 413

6 4 5
- <u>2 3 2</u>
<u>4 1 3</u>
</td>
<td>
<u>Column Subtraction (with multiple exchanges):</u>

721 - 556 = 165

6 [1]1
~~7~~ ~~2~~ [1]1
- <u>5 5 6</u>
<u>1 6 5</u>
</td></tr>
<tr><td>By the end of Year 4:
I can use an efficient written method of subtraction.</td>
<td>
<u>Column Subtraction:</u>

1645 - 1231 = 413

1 6 4 5
- <u>1 2 3 2</u>
<u>0 4 1 3</u>
</td>
<td>
<u>Column Subtraction (with multiple exchanges):</u>
721 - 556 = 165

6 [1]1
1 ~~7~~ ~~2~~ [1]1
- <u>1 5 5 6</u>
<u>0 1 6 5</u>
</td></tr>
</table>

<table>
<tr>
<td>By the end of Year 5:
I can use known facts, place value, knowledge of operations and brackets to calculate including all four operations with decimals to two places.</td>
<td colspan="2">Column Subtraction:
8.82 – 7.78 = 1.04
    7
  8. ~~8~~ [1]2
- 7. 7 8
  1. 0 4</td>
</tr>
<tr>
<td>I can solve problems involving subtracting negative numbers in context.</td>
<td>Number Line Methods:
Pupils use a number line to subtract numbers in a negative context.
-5 - 4 = -9
Find the difference between 7 and -15.
7 – (-15) = 22</td>
<td>The understanding that:
+ve - +ve = -   -ve - +ve = +
+ve - -ve = +   -ve - -ve = +
∴-5 - -4 = -1
May be independently held or developed by pupils and they may wish to use this knowledge when carrying out calculations of this nature.</td>
</tr>
<tr>
<td>By the end of Year 6:
I can subtract fractions by writing them with a common denominator.</td>
<td colspan="2">$\frac{3}{5} - \frac{1}{3} = \frac{4}{15}$

$\frac{3\ (x3)}{5\ (x3)} - \frac{1\ (x5)}{3\ (x5)} = \frac{9}{15} - \frac{5}{15} = \frac{4}{15}$

When answering, fractions should always be simplified or given as a mixed number.</td>
</tr>
</table>

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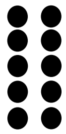
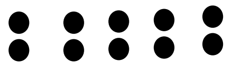
<u>Multiplication</u>

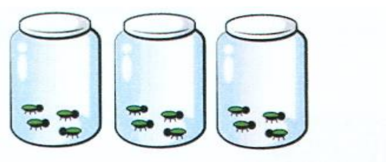
<table>
<tr><th>End of year expectations</th><th>What does this look like?</th></tr>
<tr><td><u>By the end of Year R:</u>
I can explore and represent patterns within numbers to 10, including odds & evens, doubling facts and quantities.</td><td>Children will know that doubling means to add the same amount again, ie double 3 is 3 add 3.

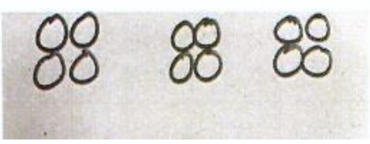
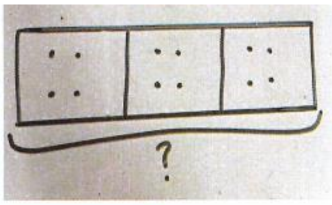
Children will understand the x symbol as 'lots of' or 'groups of,' for example 3 x 2 is '3 lots of 2' and will show this using 3 groups of 2 objects to find a total.
</td></tr>
<tr><td><u>By the end of Year 1:</u>
I can solve one-step problems involving multiplication by calculating the answer using objects, pictorial representation and arrays.</td><td>Children will revise vocabulary for multiplication, as above, understanding the x and = signs.
Children will be able to read and attempt to solve problems involving the x and = symbols.

Children will be able to solve 2x and 5x table problems using objects or diagrams, ie

2 x 5 = 10
●●●●●
●●●●●
An array is when we present this formally and in rows, as below, to make it easier to see that 2x5 and 5x2 calculate to the same answer:

2 x 5 = 10

5 x 2 = 10
</td></tr>
<tr><td>I can count in multiples of 2, 5 and 10.</td><td>Children can count in steps of 2, 5 and 10 as outlined below. This will enable them to link counting in with repeated addition and multiplication so they can identify and begin to see links between the concepts below.
For example:

<table>
<tr><td>Counting in steps</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td></tr>
<tr><td>Repeated addition</td><td>5</td><td>5 +5</td><td>5 +5 +5</td><td>5 +5 +5 +5</td><td>5+5+5+5+5</td></tr>
<tr><td>Times table</td><td>1 x 5</td><td>2 x 5</td><td>3 x 5</td><td>4 x 5</td><td>5 x 5</td></tr>
</table></td></tr>
<tr><td><u>By the end of Year 2:</u>
I can solve multiplication problems using materials, arrays, repeated addition, mental methods, including problems in contexts.</td><td>Children will be able to use objects (numicon, blocks, counters etc) to solve simple multiplication problems. For example: 3 x 4 = 12



Children will be able to use simple diagrams to show and solve multiplication problems.
For example, 3 x 4 =:


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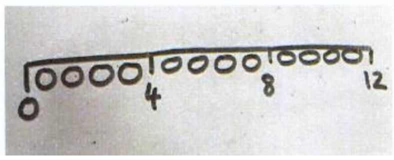
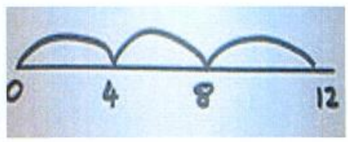
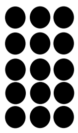
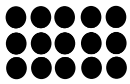
Children will understand multiplication as repeated addition (the same number added over again). For example, 3 x 4 is 4 + 4 + 4 =:





Children will begin to use arrays to understand the commutative nature of multiplication (for example 3x5 or 5x3 give the same answers)





Children will use knowledge of multiplication vocabulary to express this in number sentences.
ie: 3 x 2 = 6 and 2 x 3 = 6

Children will understand that doubling is multiplying by 2.

I can recall and use multiplication facts (and associated division facts) for the 2x, 5x and 10x tables

Children will be able to recite the 2x, 5x and 10x tables in order, knowing the pattern of numbers as set out below:
2 4 6 8 10 12 14 16 18 20 22 24
5 10 15 20 25 30 35 40 45 50 55 60
10 20 30 40 50 60 70 80 90 100 110 120
When asked, children will be able to swiftly answer times tables questions for 2x, 5x and 10x table, for example 'what is 5 x 5?' and 'what is 25 ÷ 5?'

By the end of Year 3:
I can multiply two digit numbers by 2, 3, 4 or 5 as well as 10.

Grid Method:

39 x 3 = 117

	30	9
x 3	90	27

```
  9 0
+ 2 7
1 1 7
1
```

Expanded Column Multiplication:

39 x 3 = 117

```
  3 9
x   3
  2 7   3 x  9 = 27
+ 9 0   3 x 30 = 90
1 1 7
1
```

I can recall and use multiplication facts (and associated division facts) for the 3x, 4x and 8x tables

Children will be able to recite the 3x, 4x and 8x tables in order, knowing the pattern of numbers as set out below:
3 6 9 12 15 18 21 24 27 30 33 36
4 8 12 16 20 24 28 32 36 40 44 48
8 16 24 32 40 48 56 64 72 80 88 96
When asked, children will be able to swiftly answer times tables questions for 3x, 4x and 8x table, for example 'what is 5 x 8?' and 'what is 40 ÷ 5?'

By the end of Year 4:
I can use an efficient written method of short multiplication.

Column Method for Short-Multiplication:

39 x 3 = 117

```
  3 9
x   3
1 1 7
1 2
```

I can recall and use multiplication facts (and associated division facts) for all tables up to 12x12

Children will be able to recite the 1x to 12x tables in order.
When asked, children will be able to swiftly answer times tables questions for the 1x to 12x tables, for example 'what is 5 x 8?' and 'what is 40 ÷ 5?'

By the end of Year 5:
I can use known facts, place value, knowledge of operations and brackets to calculate including all four operations with decimals to two places.

Column Method for Short-Multiplication:

41.37 x 4 = 165.48

```
  4 1 . 3 7
x         4
-----------
1 6 5 . 4 8
1     1  2
```

I understand and can use an appropriate non-calculator method for solving problems that involve multiplying any three digit number by any two digit number.

Grid Method:

415 x 23 = 9545

x	400	10	5
20	8000	200	100
3	1200	30	15

```
  8000
   200
   100
  1200
    30
+   15
------
  9545
```

Column Multiplication:

415 x 23 = 9545

```
    4 1 5
x     2 3
---------
  1 2 4 5
  1   1
+ 8 3 0 0
    1
---------
  9 5 4 5
```

By the end of Year 6:
I can multiply an integer by a fraction.

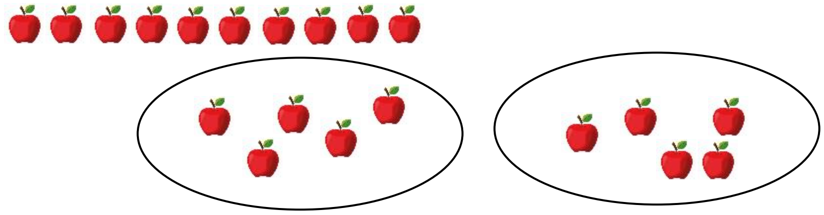
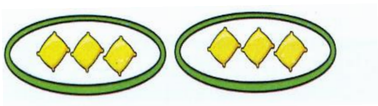
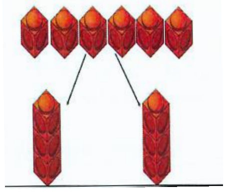
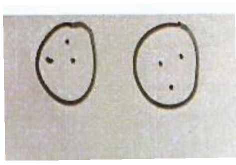
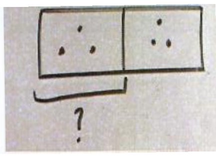
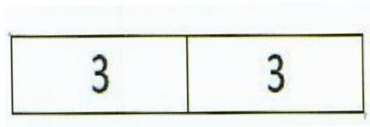
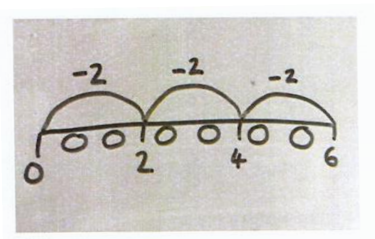
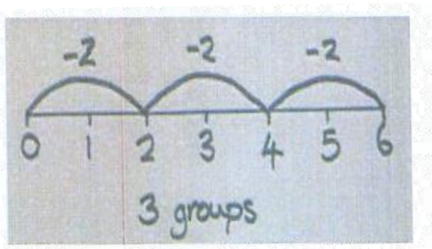
$\frac{1}{2} \times 4 = 2$

$\frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2$

When answering, fractions should always be simplified or given as a mixed number.

Successful Learners **_Confident Individuals_** **_Responsible Citizens_**

Division

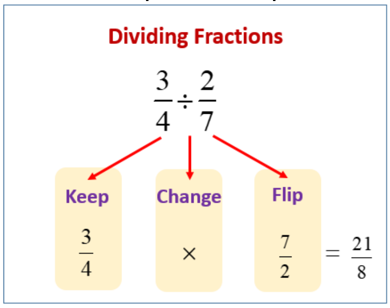
End of year expectations	What does this look like?
By the end of **Year R:** I can explore and represent patterns within numbers to 10, including odds & evens, doubling facts and quantities.	Children will know that halving means to split a shape or amount into 2 equal parts. Children will understand the ÷ symbol as 'sharing' or 'dividing' for example 10 ÷ 2 is '10 shared between 2' and will show this using 10 objects shared between 2 people: 
By the end of Year 1: I can solve one-step problems involving division by calculating the answer using objects, pictorial representation and arrays..	Children will be able to solve ÷ problems by dividing objects equally into hoops etc. Children will revise and understand vocabulary of division, such as divide, share, halve. Children will revise and understand ÷ and = signs. Children will use the use the ÷ and = signs to create and solve number sentences. Children will begin to understand the link between multiplication and division.
I can count in multiples of 2, 5 and 10.	See 'multiplication' above.
By the end of Year 2: I can solve division problems using materials, arrays, repeated addition, mental methods, including problems in contexts.	Children can understand division as a physical sharing of objects, first between 2 then between 5 and 10. For example, 6 ÷ 2 = 3   Children can read and attempt to solve division problems using simple diagrams or drawings. For example, 6 ÷ 2 = 3    Children can understand division as repeated subtraction, using diagrams or visual representations for support.  
By the end of Year 3: I can divide two digit numbers by 2, 3, 4 or 5 as well as 10.	Short Division: 649 ÷ 3 = 216 r1 2 1 6 r 1 3│ 6 4 ¹9
By the end of Year 4: I can use an efficient written method of short division.	Short Division: 842 ÷ 6 = 140 r2 1 4 0 r 2 6│ 8 ²4 2

<table>
<tr>
<td>By the end of Year 5:
I can use known facts, place value, knowledge of operations and brackets to calculate including all four operations with decimals to two places.</td>
<td colspan="2">Short Division:
827.24 ÷ 4 = 206.81

  2 0 6 . 8 1
4| 8 2 ²7 . ³2 4</td>
</tr>
<tr>
<td>I understand and can use an appropriate non-calculator method for solving problems that involve dividing any three digit number by any two digit number.</td>
<td>Long Division (using cheat sheet):
504 ÷ 21 = 24

   2 4
21| ⁴5 ¹0 4
- 4 2 0
   8 4

21 x 10 = 210
21 x 20 = 420
21 x 5 = 105
21 x 2 = 42
21 x 4 = 84</td>
<td>Long Division:
504 ÷ 21 = 24

   2 4
21| ⁴5 ¹0 4
- 4 2
  0 8 4
- 8 4
   0 0</td>
</tr>
<tr>
<td>By the end of Year 6:
I can divide by a fraction.</td>
<td>Use practical activities to investigate in order to understand the method.
Use formal notation to write up practical activities.</td>
<td>KEEP | CHANGE | FLIP

When answering, fractions should always be simplified or given as a mixed number.

$\frac{21}{8}$ = 21÷8 = 2 r5 = 2 $\frac{5}{8}$</td>
</tr>
<tr>
<td>I can calculate fractions of quantities.</td>
<td colspan="2">Use knowledge that to find a fraction of a quantity, you divide by the denominator.

$\frac{1}{3}$ of 516 = 172

516 ÷ 3 = 172

  1 7 2
3| 5 ²1 6</td>
</tr>
</table>

Glossary of key mathematical terms & symbols

<	**Less than symbol:** used to compare numbers, for example 8 < 12
>	**More than symbol:** used to compare numbers, for example 12 > 8
=	**Equals symbol:** to show equality, one side of an equation should equal another, for example 6 = 3 + 3.
+	**Plus, add, altogether**
-	**Minus, take-away, subtract**
x	**Multiply, times, lots of, groups of**
÷	**Divide, share**
1:1 Correspondence	**An early concept in counting:** a child will count each object and say number names in the correct order.
Arrays	An arrangement of objects, pictures or numbers in rows and columns, used when representing multiplication and division problems.
Bar model	A pictorial representation of a problem or concept where **bars** or boxes are used to represent the known and unknown quantities.
Correspondence problems	Using knowledge of times and divide problems to systematically list possible combinations from 2 groups of objects, example: I can pick 1 food and 1 drink from the menu. What are the possible combinations I could have?
Composite number	A positive integer which is **not** a prime number.
Commutative law	A law for addition or multiplication meaning that the order of the numbers doesn't affect the final total. Expresed symbolically: a+b is the same as b+a.
Cube number	A number multiplied by itself 3 times, for example 4 cubed is 4x4x4. Represented by the symbol ^{3}, for example 4 cubed is 4^3
Decimal place	The position of a digit to the right of a decimal point; for example, a third rounded to 2 decimal places would be 0.33, two places after a decimal point.
Decimal point	A small dot or point used to separate the whole number part from a fractional number part of a number.
Denominator	The bottom number in a fraction. Shows how many equal parts the item is divided into.
Distributive law	Simply: a(b+c) is the same as ab + ac. The **Distributive Law** says that multiplying a number by a group of numbers added together is the same as doing each multiplication separately.
Expanded column	The expanded column method is for solving addition or multiplication problems by writing a number so that it shows the place value of each digit. For example, the **expanded** form of 586 is 500+80+6. In the **expanded column** addition method you **expand** the numbers and then use the **column** method to add the **expanded** numbers.
Factor	A number that divides another number or expression evenly, for example the **factors** of 12 are 1, 2, 3, 4, 6 and 12.
Factor pairs	**Factors** are often given as **pairs** of numbers, which multiply together to give the original number, for example factor pairs of 12 are 2 and 6, 1 and 12, 3 and 4.
Integer	A whole positive or negative number, or 0.
Inverse operation	An operation that reverse the effect of another operation, for example addition & subtraction are inverse operations.
Long division	A method used for dividing large numbers into groups or parts - a large number (**dividend**), is divided by another number (**divisor**), to give a result (**quotient**)

	and sometimes a remainder.
Long multiplication	A method for multiplying larger numbers.
Multiple	The result of one number multiplied by another, eg multiples of 5 are 5, 10, 15, 20, 25 etc.
Multi-representation	Showing a number or problem using various equipment or pictorial representations.
Negative number	A number less than zero, indicated by the symbol – For example 2 less than 1 is -1.
Numerator	The top number in a fraction
Number sentence	An equation or sum to be solved, finished or balanced. For example 9 + 3 = 12
Non-unit fraction	A fraction where the numerator is greater than 1, for example 3/5, 2/3 or ¾.
Number bond	A pair of numbers that combine to make another number, for example number bonds of 10 are 0 & 10, 1 & 9, 2 & 8 etc.
Part-whole model	A pictorial representation of 'splitting' a number into component parts, for example 45 can be shown as 4 tens and 5 ones.
Pictorial representation	Drawn or printed representations of objects or numbers involved in maths problems.
Place value	The value of each digit in a number, for example the digit 5 in 514 is worth 500. It is understanding the difference between digits and their values depending on where it is in a number.
Positive integer scaling problems	A problem to be solved using the information already provided. In this case, using positive integers. For example, Mr Smith buys a sausage roll for £1. How much would 4 sausage rolls cost?
Positive number	A number larger than 0.
Prime number	A number that only has 2 **factors,** for example 2, 3, 5 and 7 are **prime numbers.**
Prime factor	Factors of a number that are, themselves, prime numbers.
Remainder	An amount left over after performing a mathematical operation, usually in division. For example, 12 divided by 5 would be 2 remainder 2, 12 is shared equally into 2 with 2 left over.
Repeated addition	Adding equal groups together as a precursor to understanding multiplication, for example 5 x 4= can be understood as 5 + 5 + 5 + 5 =
Repeated subtraction	Subtracting an equal number of items from a larger group as a precursor to understanding division, for example 15 ÷ 5= can be shown as 15 -5 =10, 10-5=5, 5-5=0
Roman numeral	Any of the letters representing numbers in the Roman numerical system: I = 1, V = 5, X = 10, L = 50, C = 100, D = 500, M = 1,000. In this system a letter placed after another of greater value adds (XVI or xvi is 16), whereas a letter placed before another of greater value subtracts (XC is 90).
Short division	A quick method of dividing numbers, sometimes known as the 'bus stop' method.
Short multiplication	A quick method for multiplication of numbers by a single-digit number.
Square number	A number multiplied by itself, for example 4 squared is 4x4. Represented by the symbol ^{2}, for example 4 squared is 4^2

Unit fraction	Any fraction with 1 as the **numerator** and a **whole number** as a **denominator**.
Verbal problem	See 'word problem.'
Whole number	Positive numbers from 0 onwards with no fraction or decimal point.
Word problem	A mathematical problem presented in an example situation which requires finding a solution.
Written problem	See 'word problem.'