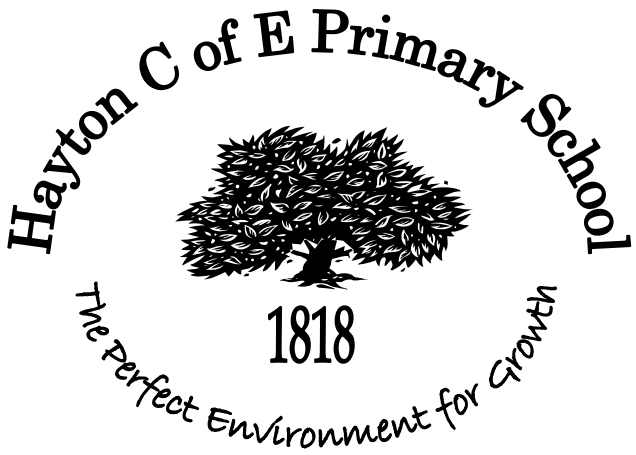


PROGRESSION IN WRITTEN CALCULATION FOR THE 4 RULES

Date: March 2018

Signed:

Review: March 2019

Progression in Written Calculation for the 4 Rules

This calculation policy has been produced to ensure consistency and progression in teaching throughout the school. It aims to give an overview of the key written calculation strategies that will be taught.

The policy aims to identify the progression in each of the four operations that children will typically follow. Each stage builds upon previous experience. It is not intended as a straightjacket, nor is it a scheme of work. It recognises that children will develop their mathematical skills at different rates and have their own individual learning styles. They will develop calculation skills through a combination of practical, oral and mental activities. Although the focus of this policy is on pencil and paper procedures, it is important to recognise that in every written method there is an element of mental processing. Written calculation strategies will therefore be taught alongside mental calculation strategies and should be seen as complementary to and not as separate from them.

Informal written recording will take place regularly and is an important part of learning and understanding. More formal written methods follow only when the child is able to use a wide range of mental calculation strategies. The emphasis of our teaching will always to be to facilitate understanding and not simply to arrive at a correct answer.

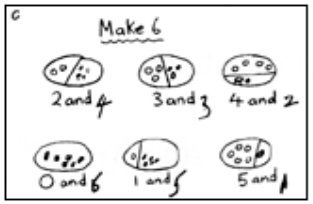
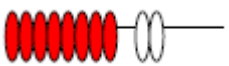
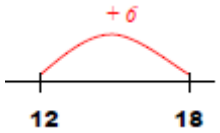
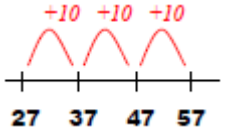
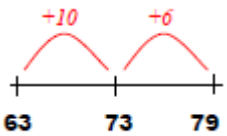
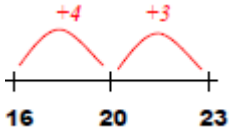
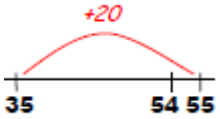
Children will always be encouraged to look at a calculation/problem and then decide which is the best method to choose. Our aim is for children to be able to select an efficient method of their choice (whether this be mental, written or using a calculator) that is appropriate for a given task. They will do this by always asking themselves:

- 'Can I do this in my head?'
- 'Can I do this in my head using drawings or jottings?'
- 'Do I need to use a pencil and paper procedure?'
- 'Do I need a calculator?'

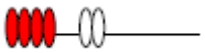
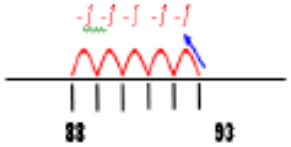
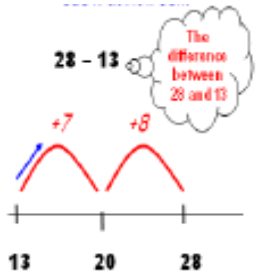
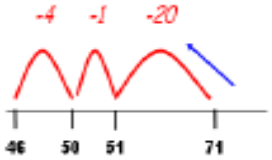
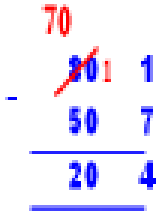
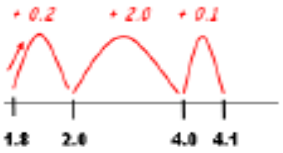
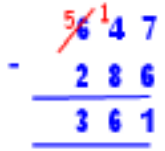
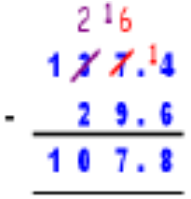
The overall aim is that when children leave Hayton C of E Primary School, they:

- have a secure knowledge of number facts and a good understanding of the four operations;
- are able to use this knowledge and understanding to carry out calculations mentally and to apply appropriate strategies when using larger numbers.
- have an efficient, reliable, compact written method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally;
- use a calculator effectively, selecting the most appropriate operation and interpreting the result.

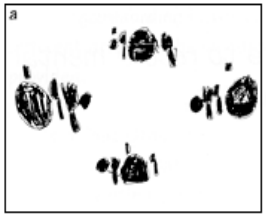
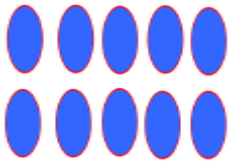
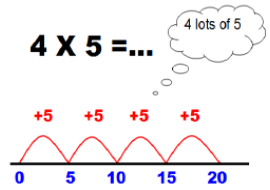
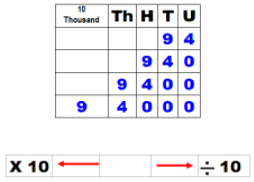
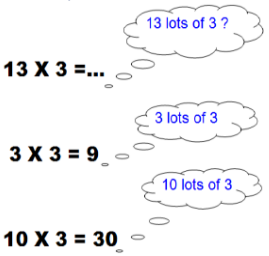
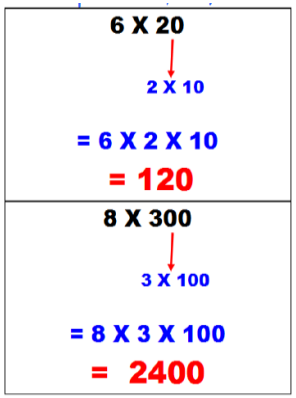
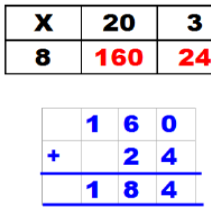
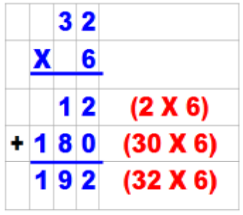
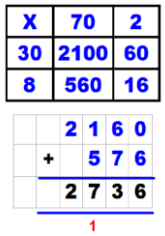
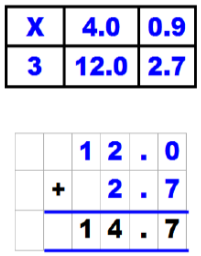
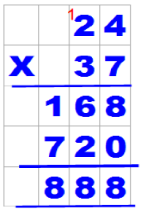
Progression in Addition

I can record calculations using pictures **Make 6**  **2 + 4 = 6** **3 + 3 = 6**	I can use bead strings or bead bars to illustrate addition **8 + 2**  **8 + 2 = 10**	I can use a number line to count on in units **12 + 6**  	I can use a number line to count on in tens **27 + 30**  27 + 10 + 10 + 10 = 57 **27 + 30 = 57**	I can use a number line to count on in tens and units by partitioning **63 + 16**  63 + 10 + 6 = 79 **63 + 16 = 79**	I can partition a number to bridge through a multiple of ten **16 + 7**  16 + 4 + 3 = 23 **16 + 7 = 23**
I can add near multiples of ten by adding in tens and then adjusting **35 + 19**  35 + 20 - 1 = 54 **35 + 20 - 1 = 54**	I can use methods of partitioning to solve more complex addition **375 + 167**  5 + 7 = 12 70 + 60 = 130 300 + 100 = 400 400 + 130 + 12 = 542 **375 + 167 = 542**	I can use the expanded method to add amounts **215 + 176** 215 + 176 11 (5 + 6) 80 (10 + 70) 300 (200 + 100) 391 **215 + 176 = 391**	I can carry numbers to add using the compact method of addition **25 + 48** 625 + 48 673 1 **625 + 48 = 673**	I can add decimal amounts using the compact method **16.4 kg + 7.68 kg** 16.40 + 7.68 24.08 1 1 **16.4 + 7.68 = 24.08 kg**	
Vocabulary: Add, addition, total, plus, more than, and, altogether, increase, equals, make, sum etc.					

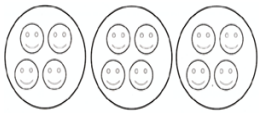
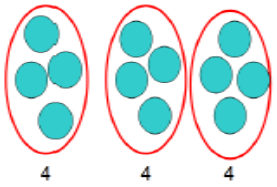
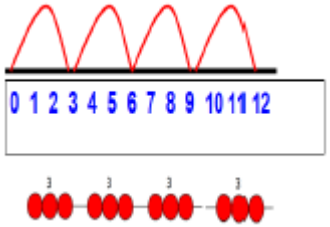
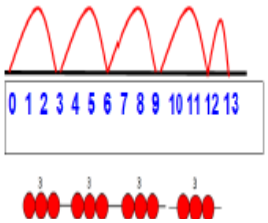
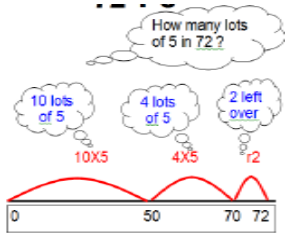
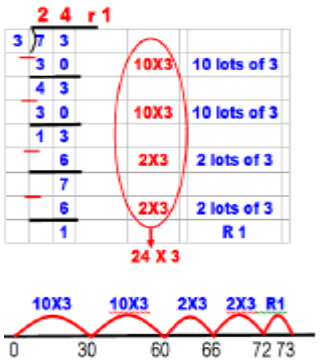
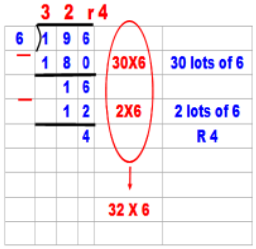
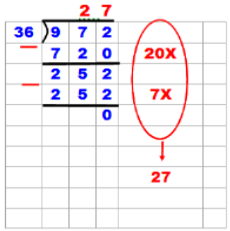
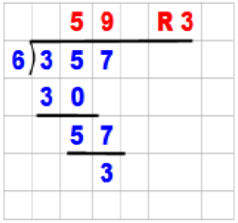
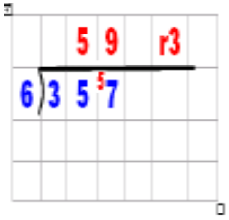
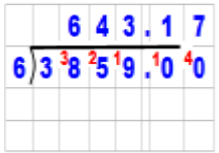
Progression in Subtraction

I can record calculations using pictures  **8 – 5 = 3**	I can use bead strings or bead bars to illustrate subtraction **6 – 2**  **6 -2 = 4**	I can use a number line to count back when subtracting **93 – 5**  **93 – 5 = 88**	I can count on using a number line to solve a subtraction sum  **28 – 13 = 15**	I bridge through multiples of 10 when counting back **71 – 25**  71 – 20 = 51 51 – 1 = 50 50 – 4 = 46 **71 – 25 = 46**	I can subtract near multiples of 10 by taking away in tens and adjusting **45 – 19**  **45 – 19 = 26**
I can partition numbers and subtract using decomposition **81 – 57**  **81 – 57 = 24**	I can solve more complex subtractions by partitioning and decomposition **754 – 136**  **754 – 136 = 618**	I can use a number line to subtract (or find the difference between) decimal amounts **4.1 – 1.8**  1.8 + 0.2 + 2.0 + 0.1 = 4.1 **4.1 – 1.8 = 2.3**	I can use compact decomposition to solve subtraction sums **647 – 286**  **647 – 286 = 361**	I can use compact decomposition to solve decimal subtraction sums **137.4 – 29.6**  **137.4 – 29.6 = 107.8**	
Vocabulary: Subtract, subtraction, take away, minus, less than, difference, decrease, leave, how many left etc					

Progression in Multiplication

<table>
<tr>
<td>I can count in 2s, 5s and 10s, I can place objects in equal groups.
  </td>
<td>I can understand multiplication as repeated addition.
 
5 x 2
= 2+2+2+2+2
= 10</td>
<td>I can understand multiplication as repeated addition using a number line.
 
4 X 5 =...
4 lots of 5
+5 +5 +5 +5
0 5 10 15 20
4 x 5 = 20</td>
<td>I can multiply numbers by 10, 100, 1000.
 
94 x 10 = 940
94 x 100 = 9400
94 x 1000 = 94000</td>
<td>I can partition numbers to simplify multiplication.
 
13 X 3 =...
13 lots of 3 ?
3 X 3 = 9
3 lots of 3
10 X 3 = 30
10 lots of 3
13 x 3 = 39</td>
<td>I can solve problems involving multiples of 10, 100, 1000.
 
6 X 20
2 X 10
= 6 X 2 X 10
= 120
8 X 300
3 X 100
= 8 X 3 X 100
= 2400</td>
</tr>
<tr>
<td>I can use the grid method to solve multiplication problems.
23 x 8 =
 
23 x 8 = 184</td>
<td>I can use expanded multiplication methods.
32 x 6 =
 
32 x 6 = 192</td>
<td>I can use the grid method to solve more complex problems.
72 x 38 =
 
72 x 38 = 2736</td>
<td>I can use the grid method to include decimal numbers.
4.9 x 3 =
 
4.9 x 3 = 14.7</td>
<td>I can use the compact method of multiplication (TU x TU)
24 x 37 =
 
24 x 37 = 888</td>
<td></td>
</tr>
<tr>
<td colspan="6">Vocabulary: Multiply, multiplication, multiple, times, lots of, “groups of” product, “10 times…” etc</td>
</tr>
</table>

Progression in Division

<table>
<tr>
<td>I can share items into equal groups
I can count in 2s, 10s and 5s
  </td>
<td>I can share items into equal groups.
 
4 4 4
12 Shared between 3 is 4</td>
<td>I can understand division as repeated addition.
12 ÷ 3 =
 
12 ÷ 3 = 4</td>
<td>I can understand division as repeated addition (with remainders).
13 ÷ 3 =
 
13 ÷ 4 = 4 r 1</td>
<td>I can divide a number by using a blank number line and grouping the divisor.
72 ÷ 5 =
 
75 ÷ 5 = 14 r 2</td>
<td>I can divide a number by chunking.
73 ÷ 3 =
 
73 ÷ 3 = 24 r 1</td>
</tr>
<tr>
<td>I can divide a number by chunking (grouping in multiples of 10).
196 ÷ 6 =
 
196 ÷ 6 = 32 r4</td>
<td>I can divide a number by chunking (HTU – TU).
972 ÷ 36 =
 
972 ÷ 36 = 27</td>
<td>I can use a semi-compact division method.
357 ÷ 6 =
 
357 ÷ 6 = 59 r3</td>
<td>I can use a compact division method.
357 ÷ 6 =
 
357 ÷ 6 = 59 r3</td>
<td>I can use a compact division method (showing remainder as a decimal).
3859 ÷ 6 =
 
3859 ÷ 6 = 643.17
(to 2dp)</td>
<td></td>
</tr>
<tr>
<td colspan="6">Vocabulary: Divide, division, divided by, share, sharing, equal, equally, how many, remainder, factor, chunking.</td>
</tr>
</table>