Written Calculations Policy – Year 3

Hurst Drive Primary School

Addition +

Partitioning

$$743 + 164 = 907$$

$$700 + 40 + 3$$
$$+ 100 + 60 + 4$$
$$800 + 100 + 7 = 907$$

1. Line up the partitioned parts in columns.

2. Beginning on the right with the ones, find the total of each column. N.B. This will support later addition involving the expanded and efficient methods for columnar addition.

3. Then form the answer left-right (e.g. '800 plus 100 is 900 plus 7 equals 907')

Expanded Column Addition

```
   1 1 2          2 3 7
 +   8 6        +   8 5
       8            1 2
     9 0          1 1 0
   1 0 0          2 0 0
   1 9 8          3 2 2
```

1. Line up the digits in columns, one digit per box.

2. Add the ones, then start a new row and add the tens and so on, making connections between number facts (e.g. 3 + 8 = 11, 30 + 80 = 110)

3. Combine the numbers to find the answer.

Subtraction −

Partitioning

For this method, the numbers are partitioned so that the ones are placed under ones, tens under tens and so on.

Beginning on the right with the ones, subtract the subtrahend (bottom number) from the minuend (top number) regrouping as necessary.

$$432 - 264 = 168$$

$$\begin{array}{ccc} 300 & 120 & 12 \\ 400 + & 30 + & 2 \\ - 200 + & 60 + & 4 \\ 100 + & 60 + & 8 \end{array}$$

Expanded Column Subtraction

```
   4 5 9
 - 2 7 4
       5
     8 0
   1 0 0
   1 8 5
```

1. Line up the digits in columns, one digit per box.

2. Beginning on the right with the ones, subtract the subtrahend (bottom number) from the minuend (top number) regrouping as necessary.

3. Combine the numbers to find the answer.

Use correct place value in 'teacher talk' when modelling the method (e.g. 15 take away 7 is 8 so 150 take away 70 is 80)

Multiplication ×

Mental Multiplication (Partitioning)

For this method, the multiplicand is partitioned into its parts and each part is then multiplied by the multiplier before combining the numbers to find the answer.

$$27 \times 3 = 81$$

$$20 \times 3 = 60$$
$$7 \times 3 = 21$$
$$81$$

Short Multiplication (Expanded)

Once the mental method is secure, pupils can be introduced to the expanded method for short multiplication.

N.B. Pupils should refer to the actual values of the digits, so 50 x 5 not 5 x 5 although the relationship to 5 x 5 should be stressed.

```
     5 6
   x   5
     3 0
   2 5 0
   2 8 0
```

Pupils in Year 3 should know their 2x, 5x and 10x tables, but they will need to be taught the 3x, 4x and 8x tables.

Division ÷

Short Division

Work out how many times the divisor will divide into each digit of the dividend, starting from the left, carrying over any remainders. To start with, do not introduce calculations with remainders until all pupils are secure with the method.

```
     3 2
   3 ) 9 6
```

```
     2 2 r 1
   3 ) 6 7
```

Models and images (e.g. concrete resources, place value grids) will need to be used so that children develop their understanding of what is happening during the process of short division.

Gradation of difficulty in division for Year 3:
1. TU ÷ O (no carrying, no remainder)
2. TU ÷ O (no carrying, with remainder)
3. TU ÷ O (with carrying, no remainder)
4. TU ÷ O (with carrying, with remainder)

When learning and/or revising key multiplication facts, stress the importance of corresponding division facts.