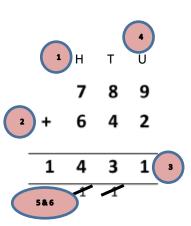Appendix 1- Ensuring Consistency

Guide to 'how to' teach Winchcombe Abbey's calculation policy for formal written methods
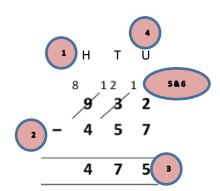
Column Addition

1- Use place value headings

2- Put the + sign at the left hand side of the calculation

3- Use two lines for the answer (can link it to a large equals sign)

4- Start at the units' column

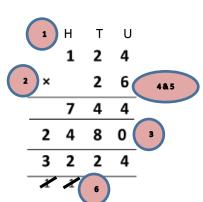5- Carry under the line

6- Cross off anything that's been carried

```
      H   T   U
      7   8   9
  +   6   4   2
  ─────────────
  1   4   3   1
```

Column Subtraction (decomposition)

1- Use place value headings

2- Put the - sign at the left hand side of the calculation

3- Use two lines for the answer (can link it to a large equals sign)

4- Start at the units' column

5- Cross off what has been exchanged

6- Put new number in small writing next to exchange

```
      H   T   U
      8  12   1
      9   3   2
  −   4   5   7
  ─────────────
      4   7   5
```

Multiplication (example for HTU x TU- adapt step 3 as necessary)
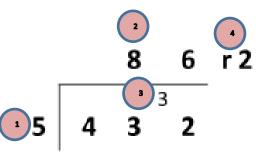
1- Use place value headings

2- Put the x sign at the left hand side of the calculation

3- Use 4 lines for the answer

4- Start at the units' column

5- Multiply each number on the bottom by each number on the top, moving from units to higher digits

6- If anything needs to be carried, put it under the lines and cross off once added (as in addition guidance)

```
      H   T   U
      1   2   4
  ×       2   6
  ─────────────
      7   4   4
  2   4   8   0
  3   2   2   4
```

Appendix 1- Ensuring Consistency

Division (bus stop)

1- Put divisor outside the 'bus stop'

2- Put answer to the division above the units' digit of the number you were dividing by (keep to place value columns)

3- Put each remainder in small numbers next to the next larger digit and then treat as a whole number when dividing

4- Record remainders in remainder, fraction, decimal or rounded in context as appropriate to the question or ability of the children

8   6 r 2

₃3

5 | 4   3   2

Appendix 2- Useful Information to Support Teaching Calculation

The following information is from: **Ruth Mertten's Course on Teaching Calculation in Primary Schools)**

1- Do not teach things we'll undo later:

- When you x by 10, you add a 0!
- Multiplication makes things bigger.
- You always have to put the biggest number first when subtracting.

2- The 4 Pillars of Calculation:

1. Place Value
   - To see if chdn understand place value ask them to write 101, calculate 3.4 x 10, write £1.05 as a decimal and calculate 0.2 x 0.2
2. Number facts
   - Memorisation is a key skill, which, due to technology, is being lost in the UK. WAPS has a big focus on this, using Passport sessions, mental starters, Big maths, mental maths tests and times table focuses.
3. Models and images
   - As maths is an abstract concept, children need something in their heads to base their maths on.
   - Use of number lines needs to be consistent, and used for comparing and ordering numbers. Each classroom needs a pegged line. Ruth's suggestion is that it looks like this:
   - R: 0-20
   - Y1 and Y2: beaded number line and landmark line (landmarks 0, 10, 20, 30- 100 marked)
   - Y3: a landmark line and a blank number line
   - Y4-6: a blank number line
   - We also need blank number grids (1-100 or different number patterns)
4. Doubling and halving
   - Understanding 13÷5 is 26÷10 etc.
   - 100,000÷8 is the same as ÷2, ÷2, ÷2 again!

Appendix 2- Useful Information to Support Teaching Calculation

Subtraction

It is key to focus on 3 types of subtraction: difference (counting on or back), taking away and place value. (**Ruth Mertten's Course on Teaching Calculation in Primary Schools**)

Mental	Written
These 3 calculations would each need to be tackled in a different way: 55-7 (taking away)- The numbers are far apart and the bit which needs 'taking away' is small enough to do so. 55-47 (difference)- The numbers are close together so you would either need to count on or back. 155-99 (place value)- These numbers lend themselves to rounding 99 to 100, subtracting 100, then adjusting. **Children need to be able to partition.** **They need to know the quickest way to do the subtraction.** Mathematicians always find the easiest way! Teach chdn how to assess the best way to do each calculation. **Subtraction in infants is most often not 'taking away', so we should call it subtraction as a general term.**	Give children a method to use, following our calculation policy. Giving chdn practise at written calculations is a must. Make sure these are graded. When teaching the process the examples should go from easy to hard, at the chdn's own level.

Division

We decided as a staff that we would use bus stop method as our division method from Y3 onwards. This should be in conjunction with learning division facts as part of times tables. This will support fluency in multiplication, also.

We will not be undertaking long division or chunking as a method, as they are ineffiecient and prone to error. (**Good practice in primary mathematics: evidence from 20 successful schools (November 2011, 110140) Paragraphs 28-34**)