Year 5 Formal Methods of Calculation

Addition

- Add numbers up to and with more than 4 digits.
- Add decimals with 2 decimal places.

Step 1

```
 Th H T O
  4, 2 1 4
+ 3, 9 3 6
———————————
        0
        1
```

As always, start by adding the ones column. 4 + 6 = 10. Place a 0 in the ones column and re-group 10 to the tens column.

Step 2

```
 Th H T O
  4, 2 1 4
+ 3, 9 3 6
———————————
      5 0
      1
```

Add up all the digits in the tens column. Don't forget about the 10 that was re-grouped.

Step 3

```
 Th H T O
  4, 2 1 4
+ 3, 9 3 6
———————————
    1 5 0
    1   1
```

Move on to the hundreds column. 200 + 900 = 1100. Put the 1 in the hundreds column and re-group the 1 in the thousands.

Step 4

```
 Th H T O
  4, 2 1 4
+ 3, 9 3 6
———————————
  8, 1 5 0
    1   1
```

Add up all the thousands to find the answer!

4000 + 3000 + 1000 = 8000.

Final

```
 Th H T O
  4, 2 1 4
+ 3, 9 3 6
———————————
  8 1 5 0
```

4214 + 3936 = 8150.

Decimal Addition

```
  £ 2 3 · 5 9
+ £  7 · 5 5
——————————————
  £ 3 1 · 1 4
```

Subtraction

- Subtract with at least 4 digits, including money and measure
- Subtract with decimal values

Step 1

```
 Th H T O
  4, 3 2 8
- 1, 4 3 6
———————————
        2
```

Start with the ones column and subtract the two numbers.

Step 2

```
 Th H T O
       2 1
  4, 3 2 8
- 1, 4 3 6
———————————
      9 2
```

Moving on to the tens column, exchange from the hundreds column since you cannot subtract 3 tens from 2 tens. Once you have exchanged, you now have 12 tens minus 3 tens.
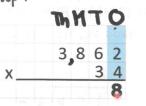
Step 3

```
 Th H T O
    3 12 1
  4, 3 2 8
- 1, 4 3 6
———————————
    8 9 2
```

In the hundreds column, exchange again from the thousands column so the subtraction becomes 12 hundred minus 4 hundred.

Final

```
 Th H T O
    3 12 1
  4, 3 2 8
- 1, 4 3 6
———————————
  2, 8 9 2
```

Finally, subtract in the thousands column. 3 thousand take away 1 thousand. Then you have your final answer!

Decimal Subtraction

```
 Th, T H, O · t
   7, 1 6 8 · 0
-     3 7 2 · 5
——————————————————
   6, 7 9 6 · 5
```

Multiplication

- Long multiplication up to 4-digits by 2 digits

Step 1

```
  Th H T O
    3,8 6 2
  x     3 4
        8
```

Start by multiplying the ones digits.

$$2 \times 4 = 8$$

Step 2

```
  Th H T O
      2
    3,8 6 2
  x     3 4
      4 8
```

Now multiply the tens digit in the ten column by 4.

$$60 \times 4 = 240$$

Step 3

```
      T O
     3 2
    3,8 6 2
  x     3 4
   1 5,4 4 8
```

Multiply the rest of the columns by 4.

Step 4

```
  Th H T O
     ●  ●
    3,8 6 2
  x     3 4
   1 5,4 4 8
           0
```

Now we are multiplying each digit by the 3 in the tens column, as this digit is in the tens column it has a value of 30, so we need to use a '0' as a place holder in the ones column.

Step 5

```
  Th H T O
    2   1
    3 8 6 2
  x     3 4
   1 5,4 4 8
 1 1 5,8 6 0
```

Multiply the rest of the digits by the tens.

Final

```
  Th H T O
      2   1
      3 8 6 2
  x       3 4
     1 5,4 4 8
   1 1 5,8 6 0
   1 3 1,3 0 8
```

Add both multiplications together to get your answers.

Division

- Divide numbers up to 4 digits by a one digit number, using the formal method of short division.
- Express remainders as r, fractions and decimals,

Step 1

$$7580 \div 5 = \boxed{?}$$

```
      15
   5 | 7,580
        2
```

5 divided into 7 (thousands) goes once.

Step 2

```
       151
   5 | 7,580
        2  3
```

5 divided into 7 (thousands) goes once (one thousand) and 2 (thousands) left over.

Final

$$7580 \div 5 = \boxed{1516}$$

```
      1516
   5 | 7,580
        2  3
```

5 divided into 25 (hundreds) goes exactly 5 (hundreds) – no remainder.

Remainders as 'r' and as a fraction

```
       8 6  r 2
   5 | 4 3 2
          3
```

```
       4 6 ½
   6 | 2 7 9
             3
```