Addition: **Column Method**

Prior Knowledge:

- Be able to correctly place numbers (integers and decimals) into a place value chart.
- Be able to change between pence and pounds in money.

There are lots of addition sums that we can work out in our heads. We can also use strategies such as partitioning or compensation to help us work them out.

When numbers become too difficult to add together in our heads, it is useful to use a standard written method for addition. This method is called the column method and involves writing numbers one above the other. It is important that units (ones) are lined up vertically, tens are lined up vertically and so on. Using this method will allow us to add integers or decimals.

Example 1

Calculate 2335 + 464.

We begin by writing the numbers one above the other – ensuring that the columns are lined up so that units are above units, tens are above tens, and so on.

```
  Th  H  T  U
   2  3  3  5
+     4  6  4
  _____
```

Beginning on the far right-hand side (in the units column), we add.

5 + 4 = 9

The 9 is written underneath in the units column.

```
   2  3  3  5
+     4  6  4
  _____
            9
```

3 + 6 = 9

```
   2  3  3  5
+     4  6  4
  _____
         9  9
```

3 + 4 = 7

```
   2  3  3  5
+     4  6  4
  _____
      7  9  9
```

Our final calculation is in the thousands column. Notice how the larger number has a 2 in the thousands column but the smaller one does not. In this case, we can fill the gap with a 0.

2 + 0 = 2

```
   2  3  3  5
+  0  4  6  4
  _____
   2  7  9  9
```

2335 + 464 = **2799**

Example 2

Now we'll try 5063 + 399. We set this out in the same way.

```
    Th  H   T   U
     5  0   6   3
+        3   9   9
   _____

   _____
```

Begin on the far right-hand side (in the units column).

3 + 9 = 12

12 is a two-digit number, so we need to carry the 1 over into the tens column, while keeping the 2 in the units column.

The 1 could go above the 6 (in the tens column), or we could place it underneath the answer space:

```
     5  0   6   3
+        3   9   9
   _____
                 2
   _____
             1
```

Either way, when we add the numbers in the tens column, we must also add on the 1.

6 + 9 + 1 = 16

16 is a 2-digit number so, like before, we carry the 1 over into the next column (in this case the hundreds column), while keeping the 6 in the tens column.

```
     5  0   6   3
+        3   9   9
   _____
             6   2
         1       1
```

When we add the numbers in the hundreds column, we must also add on the 1.

0 + 3 + 1 = 4

```
     5  0   6   3
+        3   9   9
   _____
         4   6   2
         1       1
```

Finally, 5 + 0 = 5.

```
     5  0   6   3
+        3   9   9
   _____
     5   4   6   2
         1       1
```

5063 + 399 = **5462**

Example 3

We can also use the column method when adding decimals together.

Consider the calculation:

5.43 + 7.5

Like before, we begin by writing the numbers one above the other, ensuring that the decimal points are lined up correctly.

```
  T   U   .   1/10   1/100
      5   .    4      3
+     7   .    5
  ─────────────────────
          .
```

We begin on the far right-hand side again; this time, we start in the hundredths column.

```
  T   U   .   1/10   1/100
      5   .    4      3
+     7   .    5
  ─────────────────────
          .           3
```

```
  T   U   .   1/10   1/100
      5   .    4      3
+     7   .    5
  ─────────────────────
      2   .    9      3
 1
```

```
  T   U   .   1/10   1/100
      5   .    4      3
+     7   .    5
  ─────────────────────
  1   2   .    9      3
 1
```

5.43 + 7.5 = **12.93**

Example 4

Similarly, we are able to use the column method when adding integers and decimals together.

77 + 2.74

```
  T   U   .   1/10   1/100
  7   7   .
+     2   .    7      4
  ─────────────────────
          .
```

```
  T   U   .   1/10   1/100
  7   7   .
+     2   .    7      4
  ─────────────────────
          .           4
```

```
  T   U   .   1/10   1/100
  7   7   .
+     2   .    7      4
  ─────────────────────
          .    7      4
```

```
  T   U   .   1/10   1/100
  7   7   .
+     2   .    7      4
  ─────────────────────
  7   9   .    7      4
```

77 + 2.74 = **79.74**

Your Turn

1. Calculate each of the following:

   a. 465 + 321

     + _____
        _____

   b. 325 + 122

     + _____
        _____

   c. 764 + 213

     + _____
        _____

   d. 431 + 253

     + _____
        _____

   e. 641 + 325

     + _____
        _____

   f. 1058 + 431

     + _____
        _____

   g. 5683 + 1316

     + _____
        _____

   h. 4208 + 1581

     + _____
        _____

2. Calculate each of the following:

   a. 216 + 135

     + _____
        _____

   b. 456 + 381

     + _____
        _____

c. 779 + 528

+ _____

  _____

f. 1720 + 898

+ _____

  _____

d. 355 + 279

+ _____

  _____

g. 6985 + 1099

+ _____

  _____

e. 2732 + 1409

+ _____

  _____

h. 9999 + 998

+ _____

  _____

3. Calculate each of the following:

a. 4.5 + 2.3

+ _____

  _____

d. 14.7 + 5.6

+ _____

  _____

b. 5.6 + 3.6

+ _____

  _____

e. 23.7 + 14.9

+ _____

  _____

c. 6.5 + 7.9

+ _____

  _____

f. 125.68 + 114.5

+ _____

  _____

g. 289.5 + 108.39

+ _____

_____

h. 1056.9 + 498.52

+ _____

_____

4. Calculate each of the following:

a. 26 + 6.05

+ _____

_____

e. 1026.57 + 75.045

+ _____

_____

b. 5.858 + 12

+ _____

_____

f. 63.26 + 104

+ _____

_____

c. 34.2 + 175

+ _____

_____

g. 1074.26 + 1.0005

+ _____

_____

d. 961 + 56.08

+ _____

_____

h. 986.25 + 2587

+ _____

_____

5. The table gives information about some of the items sold in the school stationery shop.

Pen	30p
Pencil	£0.09
Calculator	£8.49
Ruler	15p
Protractor	55p
Rubber	£0.08

Work out the total cost for each of the following, giving your answers in pounds (£).

a. 2 pens, 1 pencil and 1 calculator.

_____

_____

b. 2 pencils, 1 ruler, 1 rubber, 2 pens.

_____

_____

c. 1 calculator, 1 rubber and 1 pencil.

_____

_____

d. 1 protractor, 1 rubber, 1 ruler, 2 pens and 3 pencils.

_____

_____

e. Mona spends exactly £9.25 and buys 5 items. What did she buy?

_____

_____

Challenge

Here are 6 number cards:

15.002	167	11.4	3.75	881	78.1

Find **two** numbers which add together to make:

a. 178.4

_____

b. 15.15

_____

c. 959.1

_____

d. 18.752

_____

e. 1048

_____