Key Vocabulary

- Add
- Total
- Make
- Plus
- Sum
- More
- Altogether
- Difference
- Leave
- Subtract
- Difference between
- Less
- Minus
- Take away
- Mentally, Orally
- Column Addition
- Column Subtraction
- Estimate
- Inverse operation
- Solve problems
- Number facts
- Place Value
- Complex

Add and Subtract Whole Numbers

Column Method

$$
\begin{array}{r}
4\;5\;8\;6\;4 \\
+\;2\;3\;4\;9\;7 \\
\hline
6\;9\;3\;6\;1 \\
{\scriptstyle 1\;1\;1}
\end{array}
$$

Starting with the ones, add each column in turn. Regroup tens, hundreds, thousands, ten thousands as required.

$$
\begin{array}{r}
3\;5\;\overset{6}{7}\,\overset{13}{4}\,\overset{1}{2} \\
-\;\;\;\;3\;4\;7\;6 \\
\hline
3\;2\;2\;6\;6
\end{array}
$$

Starting with the ones, subtract each column in turn. Exchange tens, hundreds, thousands and/or ten thousands as required.

Multiply up to 4-digit by 2-digit

$$
\begin{array}{r}
{\scriptstyle 1}\;\overset{3}{}\;\overset{2}{} \\
1\;5\;4 \\
\times\;\;\;2\;6 \\
\hline
9\;2\;4 \\
3\;0\;8\;0 \\
\hline
4\;0\;0\;4 \\
{\scriptstyle 1\;1}
\end{array}
$$

Start with the ones.

$154 \times 6 = 924$

$154 \times 20 = 3080$

$3080 + 924 = 4004$

Order of Operations

B	Brackets	$10 \times (4 + 2) = 10 \times 6 = 60$
O	Order	$5 + 2^2 = 5 + 4 = 9$
D	Division	$10 + 6 \div 2 = 10 + 3 = 13$
M	Multiplication	$10 - 4 \times 2 = 10 - 8 = 2$
A	Addition	$10 \times 4 + 7 = 40 + 7 = 47$
S	Subtraction	$10 \div 2 - 3 = 5 - 3 = 2$

Short Division

Start from the left.

```
        4 4 0 · 5
12 | 5 ⁵2 ⁴8 6 · ⁶0
```

$5 ÷ 12 = 0\ r5$
$52 ÷ 12 = 4\ r4$
$48 ÷ 12 = 4$
$6 ÷ 12 = 0\ r6$

Long Division

```
          1 2 0   r 3
14 | 1 6 8 3
     1 4 0 0
       2 8 3
       2 8 0
           3
```

Common Factors

Factors of 48

| 1 | 2 | 3 | 4 | 6 | 8 | 12 | 16 | 24 | 48 |

Factors of 30

| 1 | 2 | 3 | 5 | 6 | 10 | 15 | 30 |

Common factors: 1, 2, 3, 6

Common Multiples

Multiples of 3

| 3 | ... | 18 | 21 | 24 | ... | 39 | 42 |

Multiples of 7

| 7 | 14 | 21 | 28 | 35 | 42 |

Common multiples: 21, 42...

Primes

A prime number has only **1** and itself as factors: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 33, 37, 41, 43

A composite number has factors other than **1** and itself.

Squares and Cubes

Square numbers result from a number being multiplied by itself (e.g. $5 × 5 = 25$):

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

Cube numbers result from a number being multiplied by itself twice ($2 × 2 × 2 = 8$):

1, 8, 27, 64, 125

Mental Calculations and Estimation

Order of calculations:

$50 × 34 × 2 = 50 × 2 × 34 = 100 × 34 = 3400$

Money: £8.99 + £3.49 = £12.48

Use £9 + £3.50 = £12.50 and subtract 2p

Estimate on a number line

```
  -8      0      8      16  20  24
  |_____|_____|_____|___|___|
                         ↑
```

Subdivide line to estimate: **17**

Reason from Known Facts

$90 ÷ 10 = 9$ so $90 ÷ 20 = 4.5$ and $90 ÷ 5 = 18$

$16 × 9 = 144$ so $1.6 × 9 = 14.4$

$4352 ÷ 17 = 256$

so $256 × 18 = 4352 + 256 = 4608$

$3786 + 2850 = 6636$

so $4786 + 2850 = 7636$

and $2786 + 3850 = 6636$

and $8636 – 3786 = 4850$