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

Add and Subtract Whole Numbers

Column Method

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

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

$$\begin{array}{r} 3\ 5\ {}^{6}\!7\ {}^{13}\!4\ {}^{1}\!2 \\ -\ \ \ \ 3\ 4\ 7\ 6 \\ \hline 3\ 2\ 2\ 6\ 6 \end{array}$$

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

$$\begin{array}{r} 5\ 3\ 8\ 2 \\ \times\ \ \ 7\ 5 \\ \hline 2\ 6_1\ 9_4\ 1_1\ 0 \quad (5382 \times 5) \\ 3\ 7_2\ 6_5\ 7_1\ 4\ 0 \quad (5382 \times 70) \\ \hline 4\ 0\ 3\ 6\ 5\ 0 \\ 1\quad\ 1\quad\ 1 \end{array}$$

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	$10 \div 2 - 3 = 5 - 3 = 2$

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...

Division Using Factors

The factor pairs of 15 are 3 and 5.

$4680 \div 15 = 4680 \div 3 \div 5$

$4680 \div 3 = 1560$

$1560 \div 5 = 312$

So $4680 \div 15 = 312$

Primes

A prime number has only 1 and itself as factors: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

A composite number has factors other than 1 and itself.

Reason from Known Facts

$90 \div 10 = 9$

so $90 \div 20 = 4.5$ and $90 \div 5 = 18$

$16 \times 9 = 144$

so $1.6 \times 9 = 14.4$

$4352 \div 17 = 256$

so $256 \times 18 = 4352 + 256 = 4608$

$3786 + 2850 = 6636$

so $4786 + 2850 = 7636$

and $2786 + 3850 = 6636$

and $8636 - 3786 = 4850$

Short Division

Start from the left.

		4	4	0	r6
12	5	^{5}2	^{4}8	6	

Squares and Cubes

Square numbers result from a number being multiplied by itself (e.g. $5 \times 5 = 25$): 1, 4, 9, 16, 25, 36, 49, 64, 81, 100

Cube numbers result from a number being multiplied by itself twice ($2 \times 2 \times 2 = 8$): 1, 8, 27, 64, 125

Mental Calculations and Estimation

Change the order of calculations:

$50 \times 34 \times 2 = 50 \times 2 \times 34 = 100 \times 34 = 3400$

Adjust Numbers:

£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**

Long Division

		2	5	r12
15	3	8	7	
-	3	0	0	
		8	7	
-		7	5	
		1	2	

Method 1 - using multiples

(15×20)

(15×5)

		1	9	1	r7
14	2	6	8	1	
-	1	4			
	1	2	8		
-	1	2	6		
			2	1	
-			1	4	
				7	

Method 2

$2681 \div 14 =$

191 r7

or

$191 \frac{7}{14} = 191 \frac{1}{2}$

Divisibility Rules

A number is divisible by:

2 if the ones digit is even

3 if the digit sum is a multiple of 3

4 if the ones digit is even when the number is halved

5 if the ones digit is 0 or 5

6 if it is divisible by both 2 and 3

10 if the ones digit is 0