

## 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

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

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

	3	5	<del>7</del> <sup>6</sup>	<del>4</del> <sup>13</sup>	<del>2</del> <sup>1</sup>
-		3	4	7	6
	3	2	2	6	6

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

		5	3	8	2
		×		7	5
	2	6 <sub>1</sub>	9 <sub>4</sub>	1 <sub>1</sub>	0
3	7 <sub>2</sub>	6 <sub>5</sub>	7 <sub>1</sub>	4	0
4	0	3	6	5	0
1	1	1			

(5382 × 5)

(5382 × 70)

## Order of Operations

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

## Common Factors

Factors of 48

1	2	3	4	6	8	12	16	24	48
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Factors of 30

1	2	3	5	6	10	15	30
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Common factors: 1, 2, 3, 6

## Common Multiples

Multiples of 3

3	...	18	21	24	...	39	42
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Multiples of 7

7	14	21	28	35	42
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Common multiples: 21, 42...

# Four Operations

## Division Using Factors

The factor pairs of 15 are 3 and 5.

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

$$4680 \div 3 = 1560$$

$$1560 \div 5 = 312$$

$$\text{So } 4680 \div 15 = 312$$

## 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

A composite number has factors other than 1 and itself.

## Reason from Known Facts

$$90 \div 10 = 9$$

$$\text{so } 90 \div 20 = 4.5 \text{ and } 90 \div 5 = 18$$

$$16 \times 9 = 144$$

$$\text{so } 1.6 \times 9 = 14.4$$

$$4352 \div 17 = 256$$

$$\text{so } 256 \times 18 = 4352 + 256 = 4608$$

$$3786 + 2850 = 6636$$

$$\text{so } 4786 + 2850 = 7636$$

$$\text{and } 2786 + 3850 = 6636$$

$$\text{and } 8636 - 3786 = 4850$$

# Knowledge Organiser

## Short Division

Start from the left.

		4	4	0	r6
12	5	<sup>5</sup> 2	<sup>4</sup> 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:



Subdivide line to estimate: 17

## Long Division

		2	5	r12	Method 1 - using multiples
15	3	8	7		(15 × 20)
-	3	0	0		
		8	7		(15 × 5)
-		7	5		
		1	2		

		1	9	1	r7	Method 2
14	2	6	8	1		2681 ÷ 14 =
-	1	4	↓	↓		191 r9
	1	2	8	↓		or
-	1	2	6	↓		191 $\frac{7}{14} = 191 \frac{1}{2}$
		2	1			
		-	1	4		
			7			

## 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