

# Four Operations

# Knowledge Organiser

## Key Vocabulary

## Add and Subtract Whole Numbers

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

### 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>6</del> 7	<del>13</del> 4	<del>1</del> 2
-		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

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

Start with the ones.

$$154 \times 6 = 924$$

$$154 \times 20 = 3080$$

$$3080 + 924 = 4004$$

### 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>	$10 \div 6 \div 2 = 10 \div 3 = 13$
<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>	$10 \div 2 - 3 = 5 - 3 = 2$

## Four Operations

### Short Division

Start from the left.

		4	4	0	5	$5 \div 12 = 0 \text{ r}5$
12	5	<sup>5</sup> 2	<sup>4</sup> 8	<sup>6</sup> 6	0	$52 \div 12 = 4 \text{ r}4$
						$48 \div 12 = 4$
						$6 \div 12 = 0 \text{ r}6$

### 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
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Factors of 30

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

Common factors: 1, 2, 3, 6

### 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.

### Mental Calculations and Estimation

Order of calculations:

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

Money:  $\pounds 8.99 + \pounds 3.49 = \pounds 12.48$

Use  $\pounds 9 + \pounds 3.50 = \pounds 12.50$  and subtract 2p

Estimate on a number line



Subdivide line to estimate: 17

## Knowledge Organiser

### 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...

### 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

### Reason from Known Facts

$$90 \div 10 = 9 \quad \text{so } 90 \div 20 = 4.5 \text{ and } 90 \div 5 = 18$$

$$16 \times 9 = 144 \quad \text{so } 1.6 \times 9 = 14.4$$

$$4352 \div 17 = 256$$

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

$$3786 + 2850 = 6636$$

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

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

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

