

Key Vocabulary
column addition
column subtraction
long multiplication
short division
long division
remainders
rounding
multi-digit
factors
multiples
prime numbers
estimate
order

## Addition

	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.

**Note:** Integers are positive numbers, negative numbers and zero. Integers do not have any added parts such as decimals or fractions

## Subtraction

	3	5	<del>6</del>	<del>13</del>	<del>1</del>
-		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.

## Short division

Start from the left.

		4	4	0	5
12	5	<sup>5</sup> 2	<sup>4</sup> 8	<sup>6</sup> 0	

$5 \div 12 = 0 \text{ r}5$   
 $52 \div 12 = 4 \text{ r}4$   
 $48 \div 12 = 4$   
 $6 \div 12 = 0 \text{ r}6$   
 $60 \div 12 = 5$

## Long division

Tommy uses this method to calculate 372 divided by 15. He has used his knowledge of multiples to help.

			2	4	r	1	2
1	5	3	7	2			
	-	3	0	0			
			7	2			
	-		6	0			
			1	2			

$1 \times 15 = 15$   
 $2 \times 15 = 30$   
 $3 \times 15 = 45$   
 $4 \times 15 = 60$   
 $5 \times 15 = 75$   
 $10 \times 15 = 150$

Interpret remainders, in fractions, or by rounding as appropriate for the context

## Multiply

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

Start with the ones.

$$154 \times 6 = 924$$

$$154 \times 20 = 3080$$

$$3080 + 924 = 4004$$

## 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...

## Prime numbers

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.

## 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

## Order of operations

When there are different operations within a calculation, the order they are completed in affects the answer. In mixed operation calculations, calculations are not carried out from left to right.

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

If there is no operation sign written, this means multiply e.g.  $4(2+1)$  means  $4 \times (2+1)$

## Mental calculations

**Change the order of calculations**

$$50 \times 34 \times 2$$

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

**Rounding**

$$£8.99 + £3.49 = £12.48$$

$$\text{Round to } £9 + £3.50 = £12.50$$

We've added 1p to each amount so then subtract 2p.  $£12.50 - 2p = £12.48$

**Estimate on a number line**



Subdivide line to estimate: 17

## Reason from known facts

Facts we know from one calculation can help us to answer another similar calculation without starting again.

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

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

$$4352 \div 17 = 256$$

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

$$3786 + 2850 = 6636$$

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

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

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