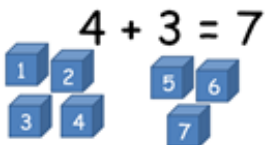
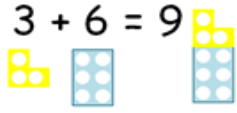




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ADDITION

SUBTRACTION

PROGRESSION	ADDITION	SUBTRACTION
Foundation	<p style="text-align: center;"><u>Practical representation</u></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Using Cubes for Addition</p>  <p>$4 + 3 = 7$</p> <p>Create 2 groups of objects, then count them as a whole.</p> </div> <div style="text-align: center;"> <p>Using Numicon for Addition</p>  <p>$3 + 6 = 9$</p> <p>Select appropriate numicon tiles. Push the tiles together and count the number of holes.</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;"><u>Practical representation</u></p> <p style="text-align: center;">Using Cubes for Subtraction</p>  <p>$8 - 5 = 3$</p> <p>Start with the higher number of cubes. Remove the lower number to get your answer.</p> </div> <div style="width: 45%;"> <p style="text-align: center;">Using Numicon for Subtraction</p> <p style="text-align: center;">$8 - 6 = 2$</p>  <p>Select the appropriate numicon tiles. Place the tiles with the smaller number of tiles on top of the larger tile. Then count the number of tiles that are not covered.</p> </div> </div>
KS1	<p style="text-align: center;"><u>Mental Calculation- Partitioning</u></p> <p style="text-align: center;">$46 + 32 = 78$</p> <p style="text-align: center;">$6 + 2 = 8 \quad 40 + 30 = 70$</p> <p style="text-align: center;">$70 + 8 = 78$</p> <p>Partition the numbers into tens and units. Add the units together. Add the tens together. Add the answers from the previous two number sentences to find the answer to the original number sentence.</p>	<p style="text-align: center;"><u>Mental Calculation- partitioning</u></p> <p style="text-align: center;">$78 - 53 = 25$</p> <p style="text-align: center;">$78 - 3 = 75$ $75 - 50 = 25$</p> <p>Partition the second (smaller) number. Subtract the units from the first (larger) number. Then subtract the tens from the second (smaller) number from the answer.</p>

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ADDITION

Number lines

Using a number line for Addition
 $4 + 3 = 7$



Find the first number on the number line.

Add the other number by jumping that number of spaces along the number line.

Don't forget to draw the jumps!

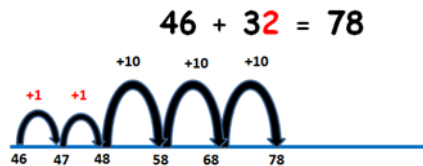
Use a blank number line

Write the first number at the left hand end of the line.

Partition the number you are adding into tens and units.

Add the units to the bigger number, drawing the jumps as you do so.

Add the tens, again drawing the jumps.



COLUMN METHOD

$$\begin{array}{r} \text{TU} \\ 27 \\ + 12 \\ \hline 39 \\ \\ 17 \\ + 18 \\ \hline 35 \\ \hline 1 \end{array}$$

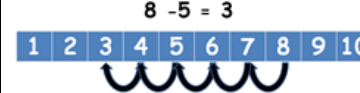
Add the numbers in the **units** column. Write the answer below the unit numbers.

Add the numbers in the tens column. Write the answer below the tens numbers. Make sure you write the numbers on top of each other.

SUBTRACTION

Number lines

Using a number line for Subtraction
 $8 - 5 = 3$



Find the larger number on the number line.

Take away the smaller number by jumping that number of spaces backwards along the number line.

Don't forget to draw the jumps!

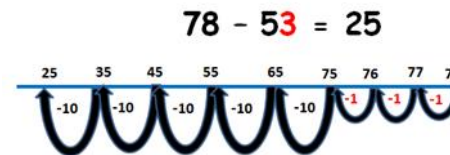
Use a blank number line

Write the bigger number at the right hand end of the line.

Partition the number you are taking away into tens and units.

Take the units away from the bigger number, drawing the jumps as you do so.

Take the tens away, again drawing the jumps.



COLUMN METHOD

$$\begin{array}{r} \text{TU} \\ 37 \\ - 25 \\ \hline 12 \end{array}$$

Subtract the smaller unit number (bottom) from the larger number (top.) Write the answer below the unit numbers. Subtract the smaller tens number (bottom) from the larger number (top). Write the answer below the tens number.

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ADDITION

- First, add the numbers in the units column. Write the unit from your answer below the unit numbers. Write the ten(s), below the space for the tens answer.
- Next add the numbers in the tens column along with the extra ten(s) created when adding the units.

$$\begin{array}{r} 2 \quad 1 \\ 32 \\ - 25 \\ \hline 7 \end{array}$$

SUBTRACTION

Exchange a ten from the larger, tens number (top) to turn the smaller, unit number into a two-digit number. Subtract the units from the smaller number (bottom) from this new, two-digit number. Write the answer below in the units column.

Subtract the tens of the smaller number (bottom) from the newly created tens (top). Write the answer below in the tens column.

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ADDITION

Lower KS2

Mental Methods

Partition into tens and units and recombine

Partition both numbers and recombine. Refine to partitioning the second number only e.g.

$$36 + 53 = \quad \text{refined to: } 36 + 53 =$$

$$6 + 3 = 9 \quad \quad \quad 53 + 6 = 59$$

$$50 + 30 = 80 \quad \quad \quad 59 + 30 = 89$$

$$80 + 9 = 89$$

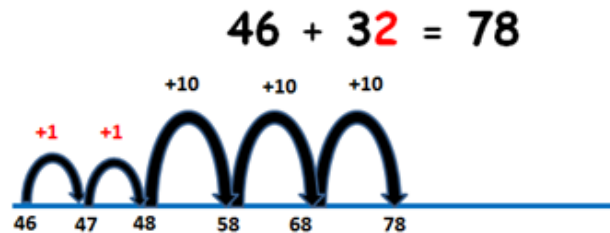
Using a blank number line

Write the first number at the left hand end of the line.

Partition the number you are adding into tens and units.

Add the units to the bigger number, drawing the jumps as you do so.

Add the tens, again drawing the jumps.



SUBTRACTION

Mental Methods

Partitioning

$$42 - 15 =$$

$$42 - 5 = 37 \text{ (partition the second number - } 15 = 10 + 5)$$

$$37 - 10 = 27$$

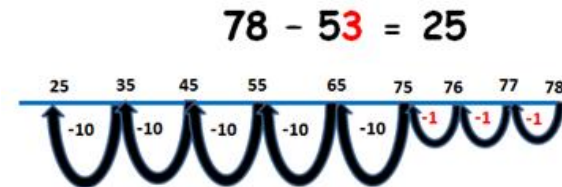
Using a blank number line

Write the bigger number at the right hand end of the line.

Partition the number you are taking away into tens and units.

Take the units away from the bigger number, drawing the jumps as you do so.

Take the tens away, again drawing the jumps.



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ADDITION

SUBTRACTION

Written methods

Column Addition

Expanded method

This method is sometimes used to help develop children's understanding of place value.

Add the units first, then tens, then hundreds.

	H	T	U
		7	6
+		4	7
	1	1	3
	1	2	3

$$76 + 47 = 123$$

Leading to Compact Method

	H	T	U
		7	6
+		4	7
	1	2	3
	1	2	3

Written methods

Column Subtraction-compact method

$$63 - 41 =$$

	T	U
	6	3
-	4	1
	2	2

Decomposition method-

$$61 - 35 =$$

	T	U
	5	1
	6	1
-	3	5
	2	6

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ADDITION

SUBTRACTION

Upper KS2

Mental Methods

Partition into hundreds, tens and units and recombine

Either partition both numbers and recombine or partition the second number only e.g.

$$\begin{aligned} 358 + 73 &= 358 + 70 + 3 \\ &= 428 + 3 \\ &= 431 \end{aligned}$$

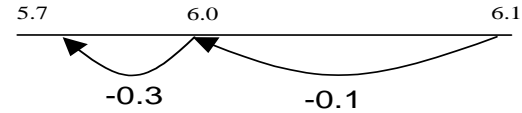
Compensation method

Adding by compensation method means adding on more than you need then adjusting.

E.g. $358 + 19 = 358 + 20 = 378 - 1 = 376$

Use known number facts and place value to subtract by **Counting Back**.

$$6.1 - 0.4 = 5.7$$



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ADDITION

SUBTRACTION

Compact method of column addition

Numbers with at least four digits

$$3587 + 675 = 4262$$

	T	H	T	U
	3	5	8	7
+		6	7	5
	4	2	6	2
	1	1	1	

Extend to numbers with any number of digits and decimals with 1 and 2 decimal places.

$$124.9 + 117.25 = 242.15$$

	H	T	U	Te	H ^{ths}
	1	2	4	.9	
+	1	1	7	.2	5
	2	4	2	.1	5
	1	1			

Standard written method

$$563 - 241 =$$

	H	T	U
	5	6	3
-	2	4	1
	3	2	2

Decomposition method

Use the language exchange a ten/ hundred and carry back to the column.

	H	T	U
	4	15	1
	5	6	1
-	2	8	5
	2	7	6