



# Heathfield Schools' Partnership

**Maths**  
**Calculation**  
**Methods**

**This booklet has been produced to outline the main methods of calculation that the children are taught as they progress through Key Stage 1 and 2. We hope it will be useful to you.**

**Each year children are taught the methods that are outlined in the National Curriculum for their year group. They do not move on to methods from the next year group until they move up a class but are challenged within lessons to apply their methods to reasoning and problem solving activities.**

**If you have any other concerns about your child's maths work please do not hesitate to contact us.**

**Link to the National Curriculum:**

<https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study>

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# Addition

## End of Reception: Early Learning Goal

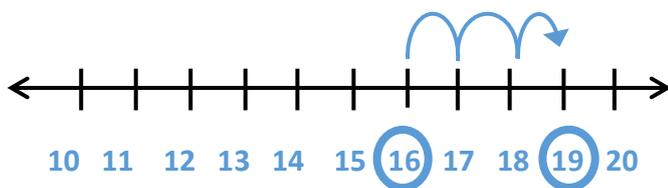
### Number:

Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on or back to find the answer. They solve problems including doubling, halving and sharing.

### Year 1

Number lines to count on, putting the largest number first.

$$16 + 3 = 19$$



Use a 100 square.

Count across in ones.

Count down in tens.

$$4 + 5 = 9$$

$$12 + 10 = 22$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

### Year 2

Partition and add:

$$\begin{array}{r} 26 \quad + \quad 32 \\ \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ 20 \quad 6 \quad 30 \quad 2 \end{array}$$

Partition: 20 6 30 2

Add ones:  $6 + 2 = 8$

Add tens:  $20 + 30 = 50$

Add altogether:  $50 + 8 = 58$

Partition again if necessary.

### Year 3

Extended column method (up to 3 digit numbers). Starting with the digit with the lowest value.

$$\begin{array}{r} + \quad 47 \\ \quad 76 \\ \hline \quad 13 \\ 110 \\ \hline 123 \end{array}$$

First add the ones  
Then add the tens  
Add both together

### Year 4

Formal column method (up to 4 digit numbers)

$$\begin{array}{r} 789 \\ +642 \\ \hline 1431 \\ \small{1 \quad 1} \end{array} \qquad \begin{array}{r} 2809 \\ +3642 \\ \hline 6451 \\ \small{1 \quad 1} \end{array}$$

### Year 5

Formal column method, using numbers with **more than** four digits.

Solve addition multi-step problems in contexts, deciding which operations and methods to use and why.

### Year 6

Formal column method, using numbers with **more than** four digits.

Solve addition multi-step problems in contexts, deciding which operations and methods to use and why.

**At the end of Year 6 the children will be tested on their formal written methods in a nationally administered 30 minute test (SATS Arithmetic Paper)**

#### Sample question

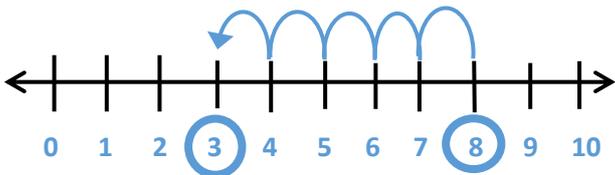
$$\begin{array}{r} 2555 \\ +8656 \\ \hline 11211 \\ \small{1 \quad 1 \quad 1} \end{array}$$

# Subtraction

## Year 1

Use number lines to count backwards.

$$8 - 5 = 3$$



Use 100 square to count back. Count across to the left for ones. Count up for tens.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

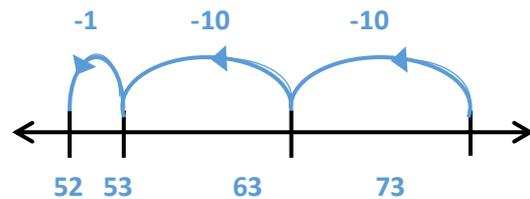
$$6 - 4 = 2$$

$$19 - 10 = 9$$

## Year 2

Draw their own number line and jumping back in tens and ones.

$$73 - 21 = 52$$



## Year 3

Introduce expanded column method. Partition each number and then subtract each column starting with the ones. Recombine for the final answer.

$$968 - 545 = 423$$

	H	T	O
	900	60	8
-	500	40	5
	400	20	3

## Year 4

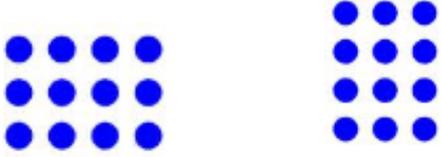
Embed column method, working with up to 4 digit numbers. Also using the compact method of recording, exchanging tens into ones, hundreds into tens, and thousands into hundreds where required.

$$\begin{array}{r}
 \overset{8}{\cancel{9}}\overset{12}{\cancel{3}}\overset{1}{\cancel{2}} \\
 - 457 \\
 \hline
 475
 \end{array}$$

	T	H	T	O
		10	15	
	7	0	0	12
	<del>8</del>	<del>7</del>	<del>0</del>	<del>2</del>
-	3	6	7	8
	4	4	8	4

Year 5	Year 6
<p>Formal column method, using numbers with <b>four or more</b> digits.</p> <p>Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Formal column method, using numbers with <b>four or more</b> digits.</p> <p>Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p> <p><b>At the end of Year 6 the children will be tested on their formal written methods in a nationally administered 30 minute test (SATS Arithmetic Paper)</b></p> <p><b><u>Sample question</u></b></p> $  \begin{array}{r}  \overset{7}{8} \overset{9}{0} \overset{9}{0} \overset{1}{6} \\  - 4658 \\  \hline  3348 \\  \hline  \end{array}  $

## Multiplication

Year 1	Year 2
<p data-bbox="89 311 632 414">Showing multiplication as repeated addition.</p> <p data-bbox="89 539 558 584">e.g.            <b>5 lots of 2</b></p> <p data-bbox="204 719 667 763"><b><math>2 + 2 + 2 + 2 + 2 = 10</math></b></p>	<p data-bbox="810 311 1374 414">Record multiplication facts using arrays.</p> <div data-bbox="869 517 1310 674"></div> <p data-bbox="837 752 1050 797">4 lots of 3            3 lots of 4</p> <p data-bbox="837 842 1374 887"><math>4 \times 3 = 12</math>            <math>3 \times 4 = 12</math></p> <p data-bbox="810 1005 1490 1216"><b>Children at the end of Year 2 are expected to know their 2, 5 and 10 times tables facts off by heart and out of sequence.</b></p>

## Year 3

Partition and multiply:

$$\begin{array}{r} 23 \times 5 = \\ \swarrow \quad \searrow \\ 20 \quad 3 \end{array}$$

Multiply tens:  $20 \times 5 = 100$

Multiply ones:  $3 \times 5 = 15$

Add altogether:  $100 + 15 = 115$

Moving onto the grid method for recording:

$$\begin{array}{r|l|l} \times & 30 & 7 \\ \hline 5 & 150 & 35 \\ \hline \end{array}$$

$150 + 35 = 185$

**Children at the end of Year 3 are expected to know their 3, 4, 6, 7 and 8 times tables facts off by heart.**

## Year 4

Short multiplication method introduced for multiplying 2, 3 and 4 digit numbers by a single digit.

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline \end{array}$$

**Children at the end of Year 4 are expected to know all their times tables facts up to  $12 \times 12$ .**

**These are tested nationally at the end of Year 4 using a computerised test (6 second recall needed for each question).**

**Websites to support the learning of times tables:**

**Times Tables Rock Stars -**  
<https://trockstars.com/>

**Timestables.co.uk -**  
<https://www.timestables.co.uk/>

**Hit the button -**  
<https://www.topmarks.co.uk/maths-games/hit-the-button>



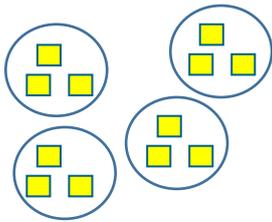
# Division

## Year 1 and Year 2

Grouping

$$12 \div 3$$

How many groups of 3 in 12?



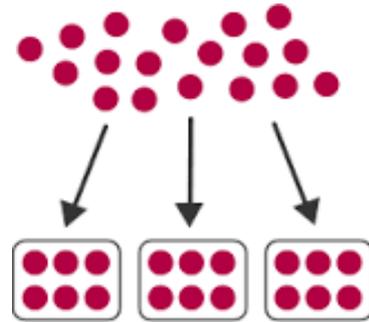
Make links to subtraction:

$$12 - 3 - 3 - 3 - 3$$

Sharing

$$18 \div 3$$

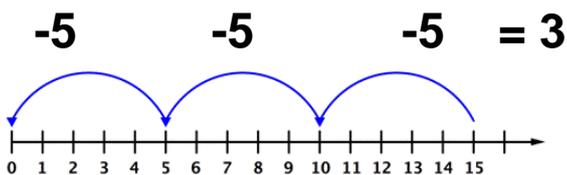
Share 18 counters between 3 people.



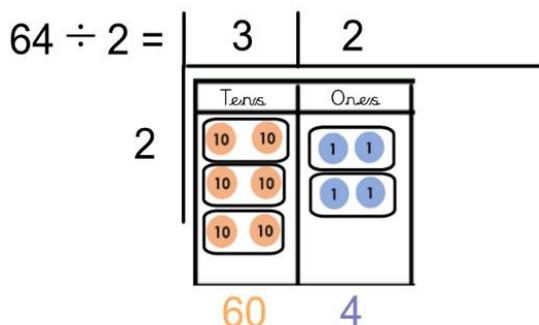
## Year 3

Jumping groups on a number line, using repeated subtraction in groups of your divisor.

$$15 \div 5 = 3$$

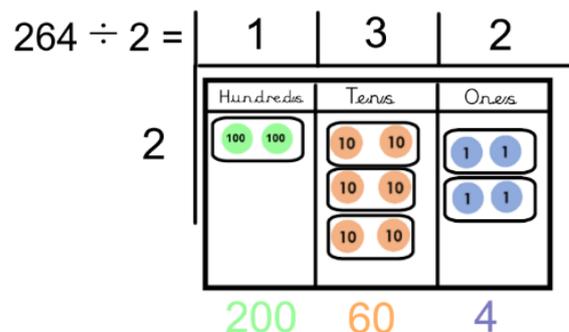


Followed by using the short division method with counters and partitioning (Tens and ones):

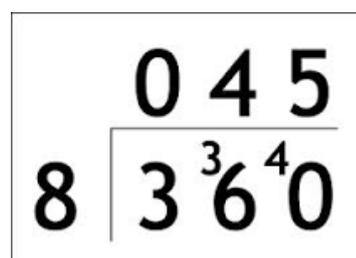


## Year 4

Short division method using counters and partitioning, including exchanging across columns (Hundreds, tens and ones):



Followed by the application of this method to the formal written short division method:



## Year 5

Embed the short method including remainders represented as numbers, or a fraction or a decimal.

$$\begin{array}{r} 137 \text{ r}5 \\ 7 \overline{)964} \end{array}$$

Example of representing the answer in decimal form:

$$\begin{array}{r} 035.5 \\ 4 \overline{)142.20} \end{array}$$

## Year 6

Long division method (the end of Year 6 test will include this).

$$\begin{array}{r} 017 \text{ r}10 \\ 25 \overline{)435} \\ \underline{0} \downarrow \\ 43 \\ \underline{25} \downarrow \\ 185 \\ \underline{175} \\ 010 \end{array}$$

## Useful Websites and Resources

[www.problempictures.co.uk/themes](http://www.problempictures.co.uk/themes)

[www.topmarks.co.uk](http://www.topmarks.co.uk)

[www.woodlandsjunior.kent.sch.uk/maths/](http://www.woodlandsjunior.kent.sch.uk/maths/)

[www.bbc.co.uk/schools](http://www.bbc.co.uk/schools)

<http://www.mathsisfun.com>

<http://www.mathletics.co.uk/> (Pupil Subscription Needed)

<http://www.educationcity.com> (Pupil Subscription Needed)

<https://www.timestables.co.uk/> (Multiplication Check Practise)

<https://ttrockstars.com/> (Times Tables Practise)

<https://www.topmarks.co.uk/maths-games/hit-the-button>

**Study guides:** Aim for ones that specify new curriculum 2014 onwards and show an example of how to do it followed by practice questions. (Available on Amazon, or from W H Smith and Waterstones).

**Resources:** Wherever possible use objects such as marbles, counters, buttons, straws, pebbles, shells to move around in the early stages of trying to understand calculations such as addition, subtraction, multiplication, division and fractions.

**Maths in the Real World:** Maths is all around you and it is your greatest teaching tool as a parent. Get children to read bus times tables, read bus numbers (even challenge them to a maths question with it), pay for things with money, weigh out food, and anything else with number. These everyday interactions are what will help your child's mental maths. It will really boost their education.