



# Collis Primary School

## Numeracy Booklet for Parents

### Key Stage 2

Our aim at Collis is for all children to enjoy maths, and also gain a number of strategies which they fully understand to confidently solve everyday maths through the rest of their lives. In order to build upon the children's knowledge and understanding of number, we teach the four operations using different methods. These methods develop as they progress and they use them to solve real life problems.

We encourage the children to work mentally, where possible, using personal jottings to support their thinking. Even when the children are taught more formal written methods, they are only encouraged to use these methods for calculations they cannot solve in their heads. Estimating the answer is also an important skill; we encourage the children to estimate the answer before completing the calculation. The children also discuss the efficiency and suitability of different strategies, explain their thinking and use the inverse operation to check their answer.

With this in mind, we have produced a booklet to provide an understanding of how we teach maths at Collis, the methods we use to teach number, as well as offering a range of ideas for you to use at home to support your child.

### Contents:

Mathematical language used for addition, subtraction, multiplication and division.

Explanations and examples of written methods of addition, subtraction, multiplication and division.

Ideas of how to relate mathematical concepts to real life situations

# Mathematical Language

+

add                      addition  
plus                     the total of  
altogether            more than  
the sum of  
greater than  
increase

-

take away            minus  
subtract              decrease  
less than              reduce  
subtraction          the difference  
fewer than

×

times  
multiplication  
multiply  
sets of/groups of  
the product of  
lots of

÷

divide  
put into groups of  
share  
put into lots of  
put into sets of  
sharing between

# Addition

To add successfully, children need to be able to:

Recall all addition pairs to 9 + 9

Add mentally a series of one digit numbers

Add multiples of 10

Recall doubling and halving facts

Partition numbers up to 1000 into 1000s, 100s, 10s and 1s.

Recall numbers bonds to 10, 20 and 100.

Use the inverse (subtraction) to check answers

## Method One :

### Recorded Methods using

#### Partitioning

$$47 + 76 =$$

	4	0	+	7	0	=	1	1	0
		7	+		6	=	1	3	
1	1	0	+	1	3	=	1	2	3

## Method Two :

### The Empty Number Line



Counting on in multiples of 100, 10 or 1.

The empty number line can be used for recording but is mainly used as a mental method for adding. The children visualise a number line in their head and use the knowledge of number bonds to 10 to find the nearest multiple and then add on the rest.

$$8 + 7 = 15$$

+2	+5
8	10
15	15

## Method Three: Partitioned Column Method

This is where the children set out the addition question in columns and add up using the partitioning method above.

$$526 + 32 =$$

6 + 2 = 8  
20 + 30 = 50  
500 + 50 + 8 = 558

	5	2	6
+		3	2
			8
		5	0
	5	0	0
			5
	5	5	8

## Method Three: Column Addition

This method is used for adding larger numbers. It is important that carry digits are recorded below the line, using the words carry ten or carry one hundred, not carry one.

$$24 + 14 =$$

	2	4
+	1	4
	3	8

$$366 + 458 =$$

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

This method can be used for adding larger numbers, decimal numbers and multiple numbers.

$$3.45 + 1.76 =$$

It is important the decimal places line up and numbers are put in the correct columns.

	3	.	4	5
+	1	.	7	6
	5	.	2	1
	1		1	

# Subtraction

To subtract successfully, children need to be able to:

Recall all addition and subtraction facts to 20.

Partitioning two and three digit numbers into hundreds, tens and ones

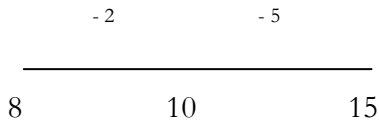
Subtract multiples of 10

Use inverse (addition) to check answers

## Method One: Using the Empty Number Line

Counting back 7 steps from 15 in small jumps using a multiple of ten.

$$15 - 7 = 8$$



## Method Two:

### Using the counting up/on method



The mental method of counting up from the smaller to larger number can be recorded using a number line.

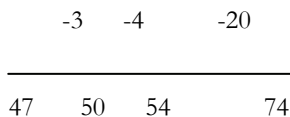
$$74 - 27 = 47$$

## Method Three: Partitioning.



This requires the children to subtract a single digit number or a multiple of 10 from a two digit number mentally. It can be recorded on a number line, but is used mainly as a mental method.

$$74 - 27 =$$



$$74 - 20 = 54$$

$$54 - 7 = 47$$

## Method Four: Column Subtraction

In this method we can take from the number 'next door' if we cannot complete the sum. We encourage the children to think of the actual number, but just abbreviate it when recording.

$$74 - 27 =$$



	6	
	7	4
-	2	7
=	4	7

This method can be used for subtracting larger numbers.

# Multiplication

To multiply successfully, children need to be able to:

Recall all multiplication facts to  $10 \times 10$

Work out products such as  $7 \times 5$ ,  $70 \times 50$ ,  $700 \times 50$ .

## Method One :



### Mental multiplication using partitioning.

This method allows tens and ones to be multiplied separately and then added together to find the total.

$$\begin{array}{r}
 14 \times 3 = \\
 \swarrow \quad \searrow \\
 10 \quad \quad 4 \\
 30 \quad + \quad 12 = 42
 \end{array}$$

Split 14 into 10 and 4, then multiply both numbers by 3 and finally add them up.

## Method Two: The grid method.

This is a similar method to partitioning, but uses a more formal recording using a grid.

$$38 \times 7 =$$

×	7
30	210
8	56
	266

$30 \times 7 = 210$   
 $8 \times 7 = 56$   
 $210 + 56 = 266$

**Method Three** The next step is to represent the method of recording in a column format. This is an alternative method to the grid.

$$38 \times 7 =$$

$30 \times 7 = 210$   
 $8 \times 7 = 56$   
 $210 + 56 = 266$

	3	8
×		7
2	1	0
	5	6
2	6	6

**Method Four** - The recording is reduced further, with carry digits recorded below the line.

$$38 \times 7 =$$

This method is helpful for sums involving decimals.

	3	8
×		7
2	6	6
	5	

**Method Five** - Once all of the above methods have been taught the children can choose the method they are most confident with. Children often find the grid method more structured when solving larger multiplication problems.

$$29 \times 286 =$$

×	20	9	
200	4000	1800=	5800
80	1600	720=	2320
6	120	54=	174
		=	8294

Multiply all the numbers together within the grid, next add them up horizontally, finally add the numbers in the end column vertically to find the total.

# Division

To divide successfully, children need to be able to:

To understand and use vocabulary related to division

Know how to find the remainder.

Recall multiplication and division facts to  $10 \times 10$ .

Understand and use  $\times$  and  $\div$  as inverse operations.



## Method One

Using their knowledge of multiplication facts to solve division questions.

$$45 \div 5 = 9$$

The children work out how many fives there are in 45 using their knowledge of the fives times tables.

## Method Two-

### Mental Division Using Partition

Using your knowledge of the times table. Split the number to make the division question more manageable. E.g.

$$\begin{array}{r} 84 \div 7 = \\ \swarrow \quad \searrow \\ 70 \quad 14 \\ 10 + 2 = 12 \end{array}$$

We know that:  
 $70 \div 7 = 10$ , then divide the number left over.  
 $14 \div 7 = 2$ . Finally add them up.

## Method Three - Short division of TU $\div$ U and HTU $\div$ U

Often referred to as 'chunking', where the children subtract multiples of the divisor.

Find a manageable multiply of 9 that goes into 120. Take this away, then find another multiple for the number that is remaining. Keep doing this until you reach a number that doesn't go into 9. Then add up the sets of 9.  $10 + 3 = 13$  and write the remainder - r3.

		1	3	r3		
9	1	2	0			
	-	9	0		(9 × 10)	
		3	0			
	-	2	7		(9 × 3)	
			3			

## Method Four - Long Division HTU $\div$ TU

$$560 \div 24 =$$

Start by multiplying 24 by multiples of 10 to get an estimate. As  $24 \times 20 = 480$  and  $24 \times 30 = 720$ , we know the answer lies between 20 and 30.

We start by subtracting 480 from 560. We are then left with 80.  $24 \times 3 = 72$  with a remainder of 8. Therefore the answer is  $23 \text{ r } 8$

## Method Five—Short Division of HTU $\div$ U

$$291 \div 3 =$$

$$\begin{array}{r} 97 \\ 3 \overline{) 291} \end{array}$$

"3 into 2 doesn't go. 3 into 29 is 9 with a remainder of 2. Carry the 2 over to make 21. Then 3 into 21 is 7. Answer 97"

	2	3	r 8		
24)	5	6	0		
-	4	8	0	(24 × 20)	
		8	0		
-		7	2	(24 × 3)	
			8		
20	+	3 =	23	r 8	

# The best way to learn is to make learning a life experience.



<b>Pocket Money</b>	Work out weekly pocket money in relation to saving for a particular item or in relation to change given etc.
<b>Supermarket</b>	Looking at packaging while shopping in relation to 3D shapes (e.g. prisms) and nets of shapes (opening out packaging to see how they are made up) Half price deals/ estimating the price of several items/whole bill/weighing out fruit and vegetables.
<b>Catalogues</b>	10% - how much? 17.5 %VAT—How much? Give the children a budget to spend (e.g. Christmas presents for the family or group of friends).
<b>Bills and Invoices</b>	Explain about household bills and discuss how they are laid out and calculated, ask the children to check them as well as discussing methods of payment (cash, cheque, direct debit etc.)
<b>Time</b>	Telling the time to five minutes, analogue, digital and the 24 hour clock. Days of the week, months of the year, days in a month, year etc If I need to be at...What time will I have to leave? Look at travel timetables and work out timings for routes. I leave the house at ...it takes me 10 minutes to walk to the station, I wait 8 minutes for the train etc,, what time do I arrive at my destination? (Analogue and digital answers)
<b>Estimation</b>	How long is the room? How much liquid is in a bottle?
<b>Cooking-weights and measures</b>	Let your child help with the cooking at home. Help them to measure ingredients accurately using weighing scales or measuring jugs. Talk about what each division on the scale stands for.
<b>Food</b>	Fractions—sharing out portions of things.
<b>Measuring</b>	Practice measuring the lengths or heights of objects (cm or metres). Help your child to use different rulers and tape measures correctly. Encourage them to estimate before measuring.
<b>Sport</b>	Football leagues/probability /estimation of how likely it is that England will win the rugby?
<b>Games</b>	Counting games, card games, pairing up cards, rummy, 21's, Monopoly.
<b>Art</b>	How do different shapes fit together? Explore the garden/house—how many different shapes can you find, what are their names and properties?

## **Number Games -**

- Throw two dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product ( $\times$ ). Can they do this in their heads?
- Use a set of playing cards. Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in two minutes?
- Play 'ping pong' to practise number bonds with your child. You say a number. They reply with how much more is needed to make 10, 20, 100, 1000. Encourage your child to answer questions quickly, without counting or using fingers.

Remember that the ideas above are just some ideas you can adapt/use at home. Many of them are important life skills which your child will need for adult life. It also brings maths to life and allows your child to practise mathematical skills without realising!  
**Good luck!**

## **Websites for Maths Games**

- [www.bbc.co.uk/education](http://www.bbc.co.uk/education)
- [www.mathszone.com](http://www.mathszone.com)
- [www.woodlandjuniors.co.uk](http://www.woodlandjuniors.co.uk)