Information Leaflet for Parents

KS2 Mathematics

Mathematics is both a key skill within school, and a life skill to be utilised throughout every person's day to day experiences. Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems.

Why do we teach maths?

The aims of teaching maths at Cockfield Primary School are:

- To ensure children have a secure knowledge of number facts and a good understanding of the four operations of number (ie, addition, subtraction, multiplication and division) and be able to apply them to real life situations, solve problems and make decisions.
- To communicate information and ideas to tackle a range of practical tasks, decision making and solving problems.
- To be able to attempt calculations mentally, where appropriate.
- To be able to use a reliable written method to solve calculations and problems.
- To be able to use ICT effectively, where appropriate.
- To develop an ability to think logically and clearly with confidence, and to develop enthusiasm and enjoyment when learning about maths.

The aim of this booklet is to inform parents and carers about some of the different methods used in school to teach mathematics and to provide tips for continuing the development of maths at home.

We hope you find it useful. If you would like further information on how your child is learning maths and the different methods of calculation, please do not hesitate to contact your child's class teacher.

How are mathematical calculations taught?

All four operations are taught in Key Stage Two (Addition, Subtraction, Multiplication and Division). We follow the guidance set out in the National Curriculum. Your children will be taught, and asked to use, a number of mental and written methods to solve these calculations.

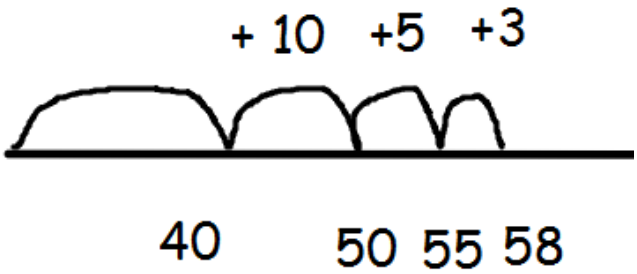
Addition and Subtraction

Key Stage 2 Vocabulary: +, _, <, >, add, addition, more, plus, increase, sun, total, altogether, doubles, near double, how many more to make…?, subtract, subtractions, take (away), minus, decrease, leave, how many are left/left over?, difference between, half, halve, how many more/fewer is…than…?, how much more/ less is…?, equals, sign, is the same as, equals and inverse.

Addition

Starting in year 3, number lines can be used for addition. On number lines calculations are always presented HORIZONTALLY, not vertically. First of all it is important that children recognise that starting with the largest number is more efficient. Children then use partitioning (which is the breaking down of numbers into tens and units) to add. Hundred squares can also be used as a visual aid in the same way.

Here is an example below, 45 has been partitioned into 40 and 5, 13 has been partitioned into 10 and 3. Hops of 10 are easiest to start with.



Therefore 45 + 13 = 58

This knowledge of partitioning can then be used in a vertical calculation where the largest part of the number is added first and the smaller part of the number is added last. However, it should be noted that children should have started learning vertical calculations by the end of year 2, therefore they are the preferred method to use in Key Stage 2

45
+13
50 add the tens first by saying **forty add ten is fifty**.

45
+13

50
8 add the ones (or units) **five add three**

45
+13
50
+8
58 now **total** the numbers

This method can then lead to a more compact method:

62**5** add the ones (or units),
+ 4**8** five add eight is thirteen
3 one ten under the tens column and
1 3 in the ones column.

62**5** add the tens, twenty add forty is
+ **4**8 sixty, plus ten underneath, seventy.
7 3 Put the seventy in the tens column.
1

625 add the hundreds, six hundreds.
+ 48 Put the six hundreds in the hundreds
673 column.
1

This compact method can also be used with larger numbers:

58**7** add the ones (or units),
+ 47**5** seven add five is twelve
2 one ten under the tens column and
1 2 in the ones column.

58**7** add the tens, eighty add seventy is
+ 47**5** one hundred and fifty plus ten
62 underneath is one hundred and sixty.
1 1 one hundred under the hundreds

column and sixty in the tens column

587 add the hundreds, five hundreds add
+ **4**75 four hundreds is 9 hundreds, plus one
1062 hundred underneath is one thousand.
1 1 One thousand in the thousand column
and zero hundreds in the hundreds column.

Subtraction

An empty number line can be used to subtract (take away) two numbers.

22 – 7 =

22

Start by marking 22 on the number line.

It's easier for children to work around the multiples of 10 and 100 when calculating.

Encourage your child to count back to the nearest multiple of 10, which in this example is 20.

-2

20 22

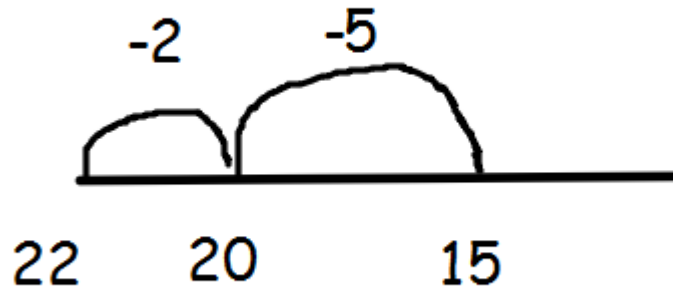
How many have you subtracted (counted back)? 2
How many more do you need to subtract (count back)? 5.
Count back 5.

-5 -2

15 20 22

How many have you subtracted (counted back)? 7
What's the answer? The answer is 15.

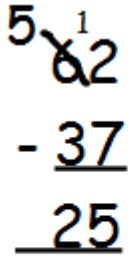
22 – 7 = 15



Children then progress to a vertical written method.

$$\begin{array}{r} 54 \\ -32 \\ \hline 22 \end{array}$$

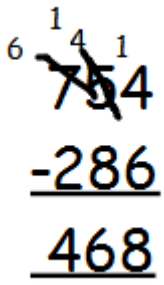
The children start by subtracting 2 from 4, which is 2 and then 3 from 5 which is 2. The answer being 22. Children can then use larger numbers involving 'stealing'.



The children are unable to subtract 7 from 2, so they steal 10 from the 6 (the 6 becomes 5). So 12-7=5, they then subtract 3 from 5 to make 2. The answer is 25.

This method then leads to using larger numbers.

754 – 286 =



Children start off by subtracting the 6 from the 4, this is not possible so they have to 'steal' 10 from the 5 making 14 (the 5 becomes 4). So now they can subtract 6 from 14 which is 8. The next step is subtracting 8 from 4 this isn't possible so we steal 10 from 7 to make 14 (the 7 becomes a 6). So now we can calculate 14-8= 6. The last step is subtracting 2 from 6, which is 4.

Multiplication and Division

Key Stage 2 Vocabulary: x, ÷, lots of, groups of times, multiply, multiplication, multiplied by, multiple of, product, once/ twice/ three times… ten times… times as (big, long, wide… and so on) repeated addition array, double, halve, share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse.

Multiplication

Early multiplication skills begin in reception with counting in different steps.

Learning and recalling multiplication tables begins in year 2. It is a vital skill which is used constantly in many areas of maths, including fractions.
Children in year 2 are still encouraged to count in twos, fives and tens, and also in threes and fours.

A strategy to help children learn multiplication tables facts from counting is to say or show the child a multiplication fact such as:

6 x 2 =

Ask the child to put up six fingers and count across the six fingers in twos.
Six lots of 2 is 12

Also with 7 x 10 =
Ask the child to put up seven fingers and count across the fingers in tens.
Seven lots of 10 is 70

It is important for children to know that 10 x 7 will give the same answer as 7 x 10, let them show this with their fingers.

Children use **partitioning** when multiplying larger numbers.

32 x 3 =

30 x 3 + 2 x 3

multiply the tens
30 x 3 = 90 (3 x 3 = 9 and 9 x 10 = 90)

multiply the ones
3 x 2 = 6

add the totals together
90 + 6 = 96

Children will then progress onto use a more compact method for multiplication.

23 x 7

23 seven times 3 is twenty one
x**7** put the **twenty** under the tens column
1 and the one in the ones column
2

23 seven times **twenty** is one hundred
x**7** and forty plus the **twenty** underneath
161 makes **one hundred and sixty**.
2 put the **sixty** in the tens column and the one **hundred** in the hundreds column.

72 x 38

72 Start with **2 x8= 16, 6 down and carry the one over**
1 x **38** (putting this at the other side of the sign and cross it off
576 when it has been added). Then **8x7= 56 then add 1= 57**.
\+ 2160 So 72 x8 = 576. Place the 'magic zero' down (use another
2736 colour so the children know its purpose). Then calculate
1 72x30 by calculating 3x2= 6 and 3x7=21. Then add the 576 and 2160 together.

Division

Early division begins with sharing in practical activities.

Children need to recognise that

15 ÷ 3 =

can mean 15 shared between 3
or
How many lots of 3 are there in 15?

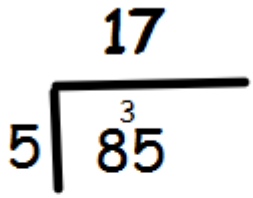
We can use a number line to find out how many threes there are in fifteen, by counting forwards or backwards in threes.

1 2 3 4 5

0 3 6 9 12 15

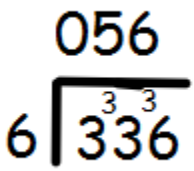
15 ÷ 3 = 5

Children are taught the short division method, which is a standard written method.



Children set division out as above, asking the question how many 5s in 8? There is 1 so that goes above. Then asking the question what is the difference between 8 and 5? This is 3 so this goes above the 5 to make 35. Now the children can ask how many 5s are in 35? The answer is 7. This goes above to make 17.

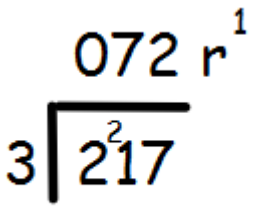
This method is then used with larger numbers like below



The children ask how many 6s are in 3? The answer is 0 (children who have more secure understanding may skip this first step), this is placed above. The 3

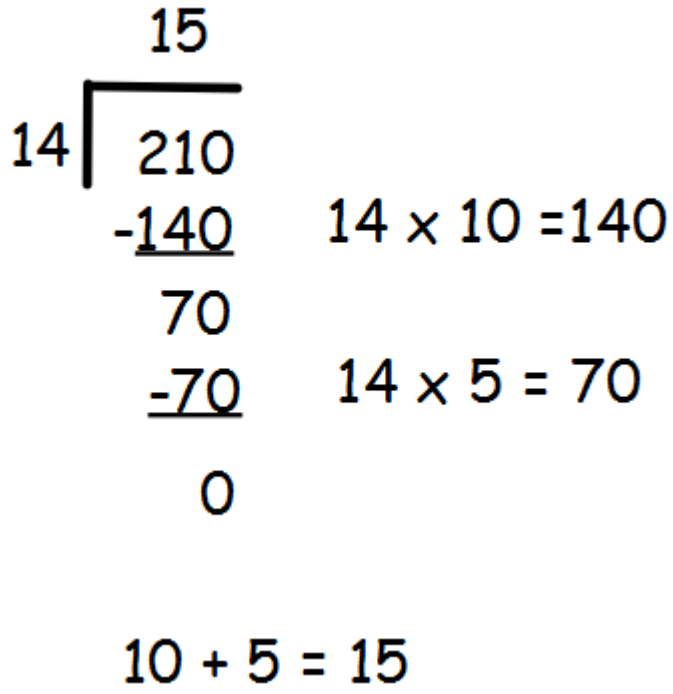
is then placed next to the other 3 to make 33. The children ask how many 6s are in 33? The answer 5 (6x5=30) therefore there is a remainder of 3. This is then placed above the 6 to make 36. The children ask how many 6s are in 36? The answer is 6 so this is placed above to make 56.

Now the children can move onto remainders, depending on their confidence they may have to start with smaller numbers.

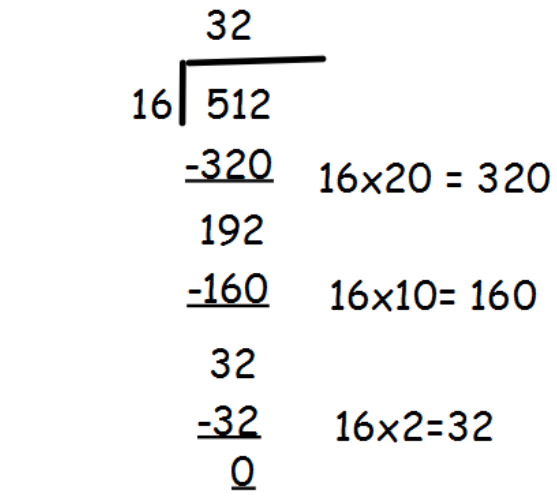


Chunking Method

Chunking is a method that should only be used when the child is highly competent in division and is usually used when both numbers are TU and higher , for examples 210 divided by 14



The children start off by chunking in 10s, so 14x10= 140, this is then subtracted off the number that it is being divided into. This then leaves 70, children should then recognise that 140 is too large to chunk so 14x5=70. This is then subtracted leaving 0. 10 +5= 15 so the answer is 15. This method can then be used for larger numbers and numbers with remainders.



20+30+2 = 32

Children should recognise that they can chunk in larger amounts, for example 16x20= 320 rather than starting off chunking by 10.

If you would like any other information about mathematics and calculation strategies, please do not hesitate to contact your child's class teacher.

Useful Websites

- http://nrich.maths.org/public/
- http://www.bbc.co.uk/schools/ks2bitesize/maths/number.shtml
- http://www.teachingtime.co.uk/
- http://www.teachingtables.co.uk
- http://www.bbc.co.uk/schools/laac/menu.shtml
- http://www.woodlandsjunior.kent.sch.uk/interactive/literacy/index.htm
- http://www.coxhoe.durham.sch.uk/