Gawthorpe
Community Academy

Calculation
at
Gawthorpe
Community
Academy

Guide for Parents

Dear Parents / Carers

We hope that this booklet will help you support your child in the methods of calculation.

To let your child explain to your how they have worked out a calculation shows how deep their understanding is.

Adding

Children start to split numbers up (partition) into tens and units.

	16		+		32	
	10	1		10	1	
		1		10	1	
		1		10		
		1				
		1				
		1				
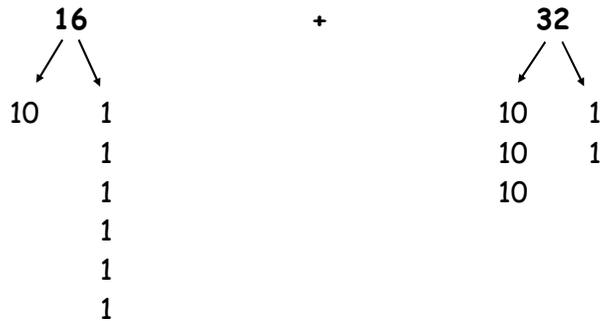
Then they add the tens together and the units.

40 + 8 = 48

Children are taught to add the tens first

46 + 25 =

```
      40          6
  +   20          5
  ──────────────────
      60          11      so 60 + 11 = 71
```

The resulting numbers are added starting with the largest numbers: 300 and 400 first, then 60 and 90, then 8 and 3.

Formal method of addition:

For example   **368 + 493**

```
        368
      + 493
        ¹ ¹
        861
```

Starting at Units: 8+3 = 11, 1 unit and 1 ten to put into 10's column.
Tens: 60+90+10=160, 6 tens and 1 hundred to put into 100's column.
Hundreds: 300+400+100=800

Talking about the value of the numbers ensures that the children do not think they are 'carrying one'.

Addition of Decimal Numbers

Children **need to** have a secure understanding of the place value of numbers involved:

For example: **46.53** is made up of: **4 tens, 6 units, 5 tenths, 3 hundredths**

Addition of numbers that have one decimal place
Children are introduced to addition of numbers that have one decimal place in the context of money:

For example: **46.7 +37.8**
In the context of money: **46 and 37 are £'s**
In the context of money: **.7 and .8 are seen as 70p and 80p**

Pounds £		Pence p
40 + 6	+	0.70 (70p)
30 + 7	+	0.80 (80p)
70 + 13	+	1.5 (£1.50)
£83	+	£1.50 = £84.50

Addition of Decimal Numbers

Formal Method of Addition of Decimal Numbers

Children need to have a secure understanding of the place value of the numbers involved:

For example: **46.53** is made up of: **4 tens, 6 units, 5 tenths, 3 hundredths**

Addition of numbers that have one decimal place

Children are introduced to addition of numbers that have one decimal place in the context of money:

For example: **46 · 7 + 37 · 8**
In the context of money: **46 and 37 are £s**
In the context of money: **.7 and .8 are seen as 70p and 80p**

$$
\begin{array}{r}
46.70 \\
+\quad 37.80 \\
\hline
{}^{1}\quad{}^{1}\qquad \\
84.50 \\
\end{array}
$$

Always start with the lowest value: hundredths or pennies to explain the concept.

0+0 hundredths = 0, 70+10 tenths = 150 or 1.50 so 50 to stay in tenths column and £1.00 or 1 whole unit to units column.

6+7+1	= 14	4 units and 1 ten.
40+30+10	= 80	

If the number of pence is greater than 100, children need to understand that there is an additional pound.

Subtraction

We use number lines for subtraction. The children count forward from the smaller number to the larger number rather than counting back from the large number to the small one.

For example: **23 - 16**
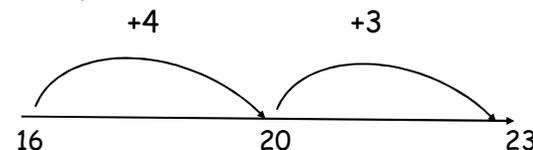
Formal Method of Subtraction

For example: **365 – 246 =**

$$
\begin{array}{r}
{}^{5}\ {}^{1}\ \\
3\overset{}{\cancel{6}}5 \\
-\quad 246 \\
\hline
119 \\
\end{array}
$$

Always start with the smallest units: units

5 subtract 6 -   Without going into negative numbers I have not got enough so I need to take a ten from the 10's column. This makes it 350+15 which still equals 365. Children need to understand that the number is not being changed. Now 15-6=9

Move onto tens column:
50-40=10   So that is 1 ten in the tens column.

Move onto hundreds column:
300-200=100   So that is 1 hundred in the hundreds column.

Subtraction of Decimal Numbers

Children are introduced to subtraction of numbers that have one decimal place in the context of money:

For example: **96·4 - 24·6**

In the context of money: **96 and 24 are £s**

In the context of money: **·4 and ·6 are seen as 40p and 60p**

The calculation becomes: **£96.40 - £24.60**

$$\begin{array}{r} {}^{5}9\overset{1}{6}.40 \\ - \quad 24.60 \\ \hline 71.80 \end{array}$$

Always start with the smallest units: hundredths or pennies in this case 0-0= 0

Move onto tenths or 10 pences:
40-60=   Without going into negative numbers I have not got enough so I need to take 1 unit or 1 pound to help me do this. This becomes 95.00 + 1.40 = 96.40. The number is not being changed. Now 1.40-0.60 (one pound forty subtract 60 pence) = 0.80

Move onto units or pounds:
5-4=   1

Move onto tens or ten pounds:
90-20=   70

Multiplication

When multiplying a 2-digit number by a 1-digit number children are taught to partition the 2-digit number and use the grid method.

For example: **28 x 9**

$$\begin{array}{c|c|c|c} X & 20 & 8 & \\ \hline 9 & 180 & 72 & \underline{\textbf{252}} \end{array}$$

Children multiply the numbers, writing the answers in the correct parts of the grid. They find the answer by adding 180 and 72.

          180 + 72 = **<u>252</u>**

Formal Method of Multiplication
This is taught when children are confident with simple grid calculations.

For example: **55 x 24 =**

$$\begin{array}{r} 55 \\ \times \quad 24 \\ \hline 20 \\ 200 \\ 100 \\ 1000 \\ \hline 1320 \end{array}$$

          20   4 x 5 = 20 (unit x unit)
          200   4 x 50 = 200 (unit x tens)
          100   20 x 5 = 100 (ten x unit)
          1000   20 x 50 = 1000 (ten x ten)
          1320   **add columns already in place**

Children begin by writing down x calculations they have done so mistakes can be easily identified. When accuracy improves these can be left out.

Division is the inverse of multiplication. We use a number line for division

For Example: **30 ÷ 5**
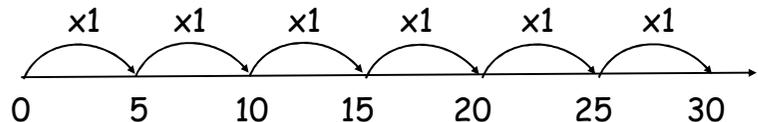
So 30 ÷ 5 = 6

When working with larger numbers children will begin with short division.

Formal Method of Dividing

Short Division: For example **152 ÷ 4 =**

$$4\overline{)152}$$

How many 4's in 1 = 0 (record above the 1 so move the 1 onto the next   number.

$$4\overline{)15\,{}^32}\quad^{03\ 8}$$

How many 4's in 15 = 3 x 4 = 12 with 3 remainder which I put with my next number.

How many 4's in 32 = 4 x 8 = 32

Long division by chunking:

For example **972 ÷ 36 =**

To find out how many 36's are in 972 by using key facts.

Starting by using multiplication facts they know.

```
         27
   36│972
    - 720        20 x
       1 1
       252
   -   180         5 x
        72
        72        2 x   (add these)
         0        27
```

Where remainders occur, children express them as fractions, decimals or use rounding depending upon the problem.

Thank you for your support.

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