


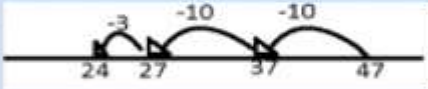
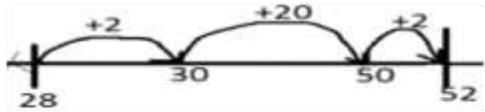
FOSTON AND TERRINGTON PRIMARY SCHOOLS Written Calculations Policy

A guide for Parents

We would like to introduce you to our new maths calculation policy. The policy has been developed specifically to provide accelerated learning and shows the clear progression of calculations for addition, subtraction, multiplication and division. The methods follow a clear thought process and show visually how each method should be carried out.

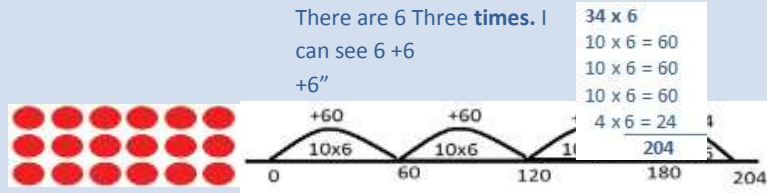
Our aim is that children become fluent in the fundamentals, reason mathematically to follow an enquiry and can solve problems by applying their mathematics. Children will be encouraged to use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately.

We would ask that when you are supporting your child with Mathematics at home that you use these methods. We understand they may not all be familiar to you and therefore if you need any further support or explanation please speak to your child's teacher. In addition, we will be providing support videos that will focus on using the calculation methods with your child.

Addition		Subtraction	
1. Begin formal recordings in a calculation:	$3 + 2 = 5$	1. Begin formal recordings in a calculation:	$6 - 1 = 5$
2. Use of number line to <u>count up</u> :	$34 + 23$ Note: Always use the largest whole number first. Next, partition into Tens and Ones E.g. add 20 add 3. 	2. Using a number line to <u>count back</u> : $47 - 23 = 24$  Partition the number; take away into tens and Ones. Next, Partition in tens using a single jump E.g. -20.	
3. Introduction to vertical layout, using partitioning:	$378 + 487$ $\begin{array}{r} 300 + 70 + 8 \\ 400 + 80 + 7 \\ 700 + 150 + 15 \end{array} = 865$	3. Using a number line to <u>count on</u> : $52 - 28 = 24$ 	
4. Vertical layout, expanded working, ones first: <i>As an additional support method (If needed)</i>	$398 + 493$ $\begin{array}{r} 368 \\ + 493 \\ \hline 11 \\ 150 \\ 700 \\ \hline 861 \end{array}$	4. Expanded Decomposition: $563 - 241$ $\begin{array}{r} 500 \quad 60 \quad 3 \\ - 200 \quad 40 \quad 1 \\ \hline 300 \quad 20 \quad 2 = 322 \end{array}$ Partition and then recombine.	
5. Formal written addition:	$789 + 642$ becomes $\begin{array}{r} 7 \quad 8 \quad 9 \\ + 6 \quad 4 \quad 2 \\ \hline 1 \quad 4 \quad 3 \quad 1 \\ 1 \quad 1 \end{array}$ Answer: 1431 Note: The numbers 'carried' will be shown under the line.	5. Formal written subtraction: $932 - 457$ becomes $\begin{array}{r} 8 \quad 12 \quad 1 \\ 9 \quad 3 \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$ Answer: 475 Note: We are not 'borrowing'. We are exchanging. E.g. I am exchanging one ten for ten ones. 'We can't take 7 away from 2 without it being a negative number.'	

Multiplication

2. Use of arrays: 3×6 or 6×3



$$56 \times 27 =$$

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 392 \\ + 1120 \\ \hline 1512 \\ 1 \end{array}$$

Digits have been 'carried' over the partial products. Eg. I will carry the four tens underneath the tens column.

Prompts in brackets can be omitted if children no longer need them.

3.

Partitioning: $34 \times 6 =$

4. Grid method:

1. Begin formal recording:

$$5 \times 2 = 10$$

$$\begin{array}{r} 38 \times 7 \\ \hline \begin{array}{|c|c|c|} \hline x & 30 & 8 \\ \hline 7 & 210 & 56 \\ \hline \end{array} \\ \hline 266 \end{array}$$

and

$$56 \times 27$$

$$\begin{array}{r} \begin{array}{|c|c|c|} \hline x & 50 & 6 \\ \hline 20 & 1000 & 120 \\ \hline 7 & 350 & 42 \\ \hline \end{array} \\ \hline 1512 \end{array}$$

Partition the two

digit number; place b. Extend to three digit numbers multiplied by two digits. each part at the top. Multiply the top number by the

side number.

7. Long Multiplication:

a. Two digit multiplied by a two digit.

$$124 \times 26 = 3224$$

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \quad (6 \times 124) \\ + 2480 \quad (20 \times 124) \\ \hline 3224 \\ 11 \end{array}$$

5. Vertical format, expanded working:- As an additional support method

$$38 \times 7 =$$

c. Extend with short and long multiplication of decimals.

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \quad (8 \times 7) \\ 210 \quad (30 \times 7) \\ \hline 266 \end{array}$$

$$53.2 \times 24 =$$

24 × 6 becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline \end{array}$$

Answer: 144

342 × 7 becomes

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

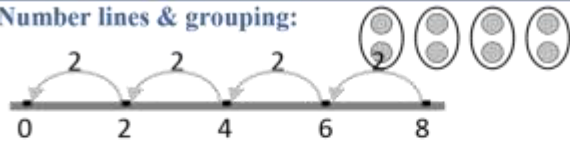
Answer: 2394

$$\begin{array}{r} 53.2 \\ \times 24.0 \\ \hline 212.8 \\ 1064.0 \\ \hline 1276.8 \end{array}$$

6.Short 1

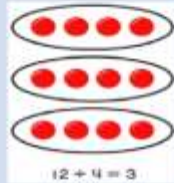
Division

1. Number lines & grouping:



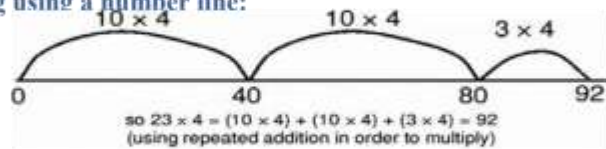
How many groups of 2 can be made from the original set of 8? 8 divided by 4 = 2

2. Arrays:



Twelve divided by four equals 3

3. Chunking using a number line:



4. Chunking:

$$48 \div 4 = 12$$

$$\begin{array}{r} 48 \\ - 40 \quad (10 \times 4) \\ \hline 8 \\ - 8 \quad (2 \times 4) \\ \hline 0 \end{array}$$

$$97 \div 4 = 24 \text{ r } 1$$

$$\begin{array}{r} 97 \\ - 80 \quad (20 \times 4) \\ \hline 17 \\ - 16 \quad (4 \times 4) \\ \hline 1 \end{array}$$

5. Short division:

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

Short Division continued:

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r } 1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer: $45 \frac{1}{11}$

Note: How many 11s divide equally into 4?

Remainder can be given as a fraction.

6. Long Division:

a. Example setting out the result as a mixed number or a remainder:

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

$$\frac{12}{15} = \frac{4}{5}$$

Answer: $28 \frac{4}{5}$

Answer: 28 remainder 12

Multiples of the divisor (15) have been subtracted from the dividend (432)

20 (groups of 15) + 8 (groups of 15) = 28 (groups of 15)

Remainder 12
Answer: 28 r 12

b. Example setting out the result as a decimal:

432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

The remainder (4/5) is expressed as a decimal.