Northwood Mathematics Calculation Policy

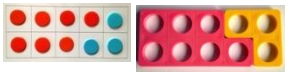
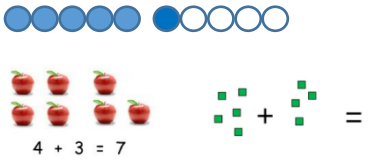
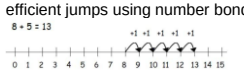
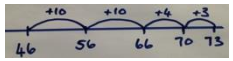
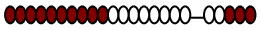
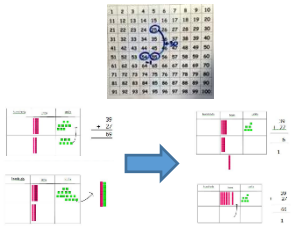
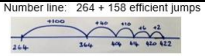
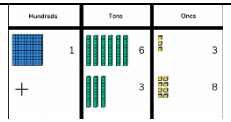
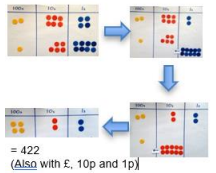
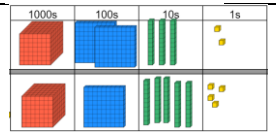
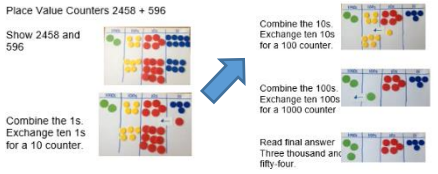
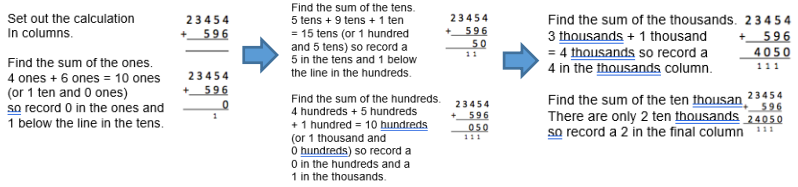
Summary

This calculation policy has been devised to support academies in understanding both the expectations for fluency of the 2014 curriculum and the progression of calculation concepts through a child's mathematical development. Northwood have adopted and altered the AET Calculation policy to suit our mastery approach to deepen the children's learning and our commitment to developing a CPA approach to calculations.

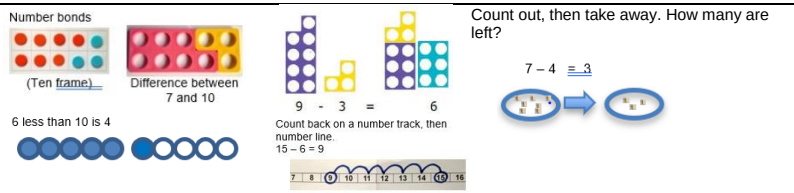
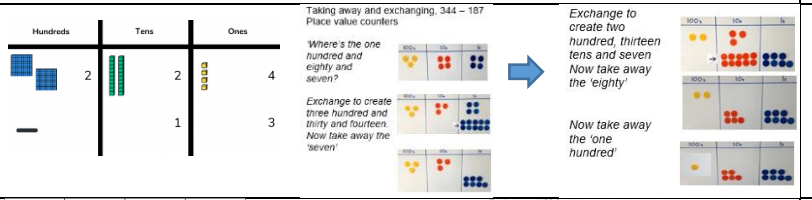
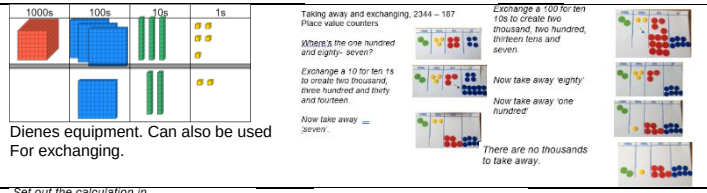
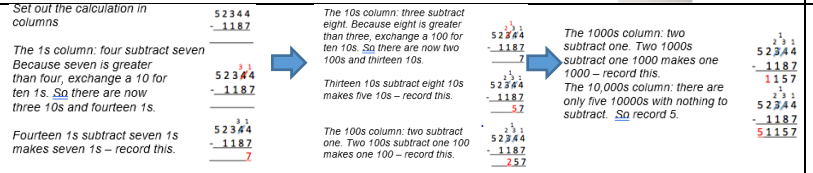
Principles

- This calculation policy is focused on developing proficiency with the expected formal written methods by the end of Year 6 and hence the progression guidance provided for each operation is designed to flow into the expected method as exemplified on the National Curriculum Appendix document (see page 6 for a summary of these).
- Specific practical equipment and approaches have been suggested for each age group to support children in developing the conceptual understanding that will enable them to move more rapidly and efficiently towards the formal written methods expected.
- It is recommended that teachers encourage children to simultaneously carry out the calculation practically using the equipment/representation suggested and to record this calculation step by step using the parallel formal written method.
- It is expected that staff will work towards the fluency goals for each age group but that, where necessary, teachers will use approaches and materials from earlier year groups to bridge any gaps in a child's understanding.
- Teachers should have an understanding of the expectations and progression for all year groups, regardless of which year group they teach.
- The 'Written Methods', 'Quick jottings or in your head' and 'Just know it' sections list the national curriculum expectations of the year group for calculation.
- The 'Developing Conceptual Understanding' section illustrates how to build children's understanding of the formal methods using a range of specific practical equipment and representations. The expected language for the formal methods is modelled in this section in the older year groups – this language should be used throughout whenever the formal method is used.
- The 'Foundations' section for each year group highlights the skills and knowledge that should be addressed on a regular basis within this year group through oral and mental starters to ensure that children have the requisite fluency to address the new approaches required.

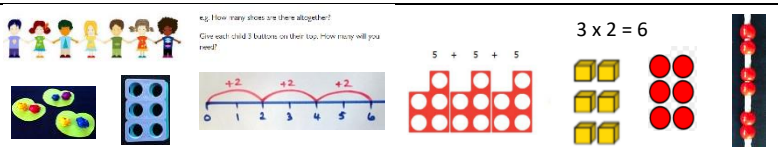
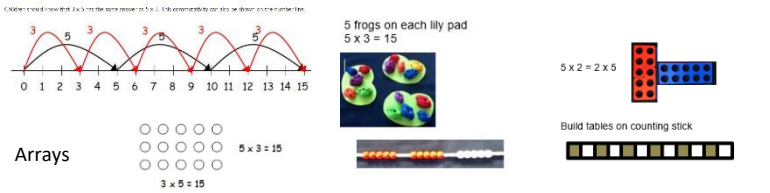
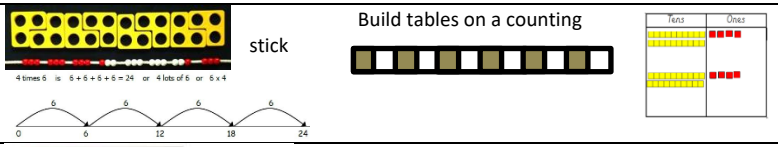
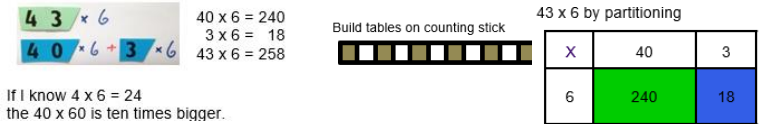
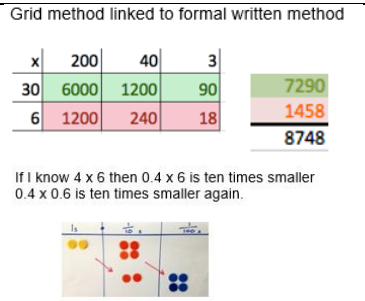
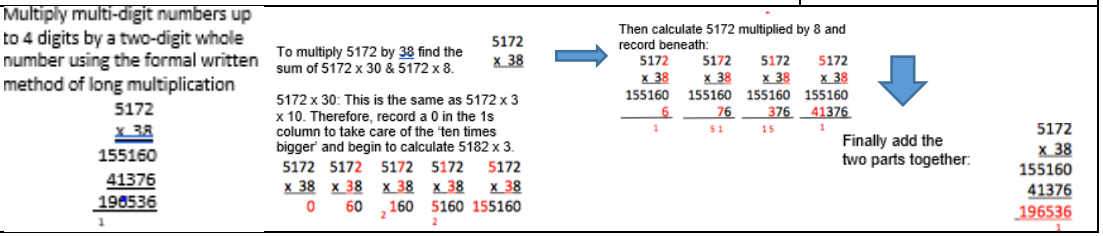
Addition

Year	Foundations	You need to know it!	Quick jottings or work it out in your head	Developing conceptual understandings	Written Methods.
1	➢ 1 more ➢ Number bonds: 5, 6 ➢ Largest number first. ➢ Number bonds: 7, 8 ➢ Add 10. ➢ Number bonds: 9, 10 ➢ Ten plus ones. ➢ Doubles up to 10 ➢ Use number bonds of 10 to derive bonds of 11	**Represent & use number bonds and related subtraction facts within 20** **Add and subtract one-digit and two-digit numbers to 20, including zero**	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9	Number bonds  (Ten frame) Numicon Count on, on number track, in 1s  Use bonds of 10 to calculate bonds of 20  4 + 3 = 7	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
2	➢ 10 more ➢ Number bonds: 20, 12, 13 ➢ Number bonds: 14,15 ➢ Add 1 digit to 2 digit by bridging. ➢ Partition second number, add tens then ones ➢ Add 10 and multiples. ➢ Number bonds: 16 and 17 ➢ Doubles up to 20 and multiples of 5 ➢ Add near multiples of 10. ➢ Number bonds: 18, 19 ➢ Partition and recombine	**Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers	Number track / Number line – jumps of 1 then efficient jumps using number bonds  46 + 27 = 73 Count in tens then bridge  18 + 5 = 2  25 + 29 by + 30 then - (Round and adjust) 	Add and subtract two two-digit numbers using concrete objects, pictorial representations progressing to formal written methods 
3	➢ Add multiples of 10, 100 ➢ Add single digit bridging through boundaries ➢ Partition second number to add ➢ Pairs of 100 ➢ Use near doubles to add ➢ Add near multiples of 10 and 100 by rounding and adjusting ➢ Partition and recombine		Add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens a three-digit number and hundreds	Number line: 264 + 158 efficient jumps  40 + 80 = 120 using 4 + 8 = 12 So 400 + 800 = 1200 243 + 198 by +200 then -2 (Round and adjust)  Pairs that make 100 23 + 77   Place value counters, 100s, 10s, 1s 264 + 158  = 422 (Also with £, 10p and 1p)	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction 
4	➢ Add multiples of 10s , 100s, 1000s ➢ Fluency of 2 digit + 2 digit ➢ Partition second number to add ➢ Decimal pairs of 10 and 1 ➢ Use near doubles to add ➢ Adjust both numbers before adding ➢ Add near multiples ➢ Partition and recombine		Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	 Dienes equipment. Can also be used with regrouping. 	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate 
5	➢ Add multiples of 10s , 100s, 1000s, tenths, ➢ Fluency of 2 digit + 2 digit including with decimals ➢ Partition second number to add ➢ Use number facts, bridging and place value ➢ Adjust numbers to add ➢ Partition and recombine		Add and subtract numbers mentally with increasingly large numbers		Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) 
6	➢ Add multiples of 10s , 100s, 1000s, tenths, hundredths ➢ Fluency of 2 digit + 2 digit including with decimals ➢ Partition second number to add ➢ Use number facts, bridging and place value ➢ Adjust numbers to add ➢ Partition and recombine		Perform mental calculations, including with mixed operations and large numbers		Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

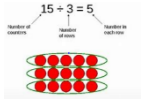
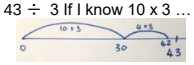
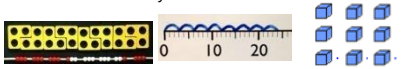
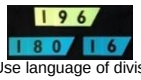
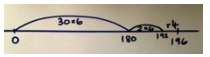
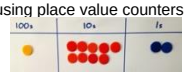
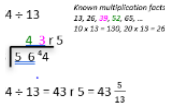
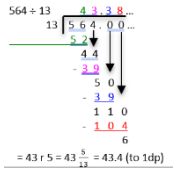
Subtraction

Year	Foundations	You need to know it!	Quick jottings or work it out in your head	Developing conceptual understandings	Written Methods.
1	➢ 1 less ➢ Number bonds, subtraction: 5, 6 ➢ Count back ➢ Number bonds, subtraction: 7, 8 ➢ Subtract 10. ➢ Number bonds, subtraction: 9, 10 ➢ Teens subtract 10. ➢ Difference between	**Represent and use number bonds and related subtraction facts within 20** **Add and subtract one-digit and two-digit numbers to 20, including zero**	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ –9		Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
2	➢ 10 less ➢ Number bonds, subtraction: 20, 12, 13 ➢ Number bonds, subtraction: 14, 15 Subtract 1 digit from 2 digit by bridging ➢ Partition second number, count back in 10s then 1s ➢ Subtract 10 and multiples of 10 ➢ Number bonds, subtraction: 16, 17 ➢ Subtract near multiples of 10 ➢ Difference between ➢ Number bonds, subtraction: 18, 19	**Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	Number track / Number line – jumps of 1 then efficient jumps using number bonds Using a number line, 73 – 46 = 26 Difference between 73 – 58 by counting up. 58 + _ = 73 23 – 5 = 18	*Add and subtract two two-digit numbers using concrete objects, pictorial representations progressing to formal written methods*
3	➢ Subtract multiples of 10 and 100 ➢ Subtract single digit by bridging through boundaries ➢ Partition second number to subtract ➢ Difference between ➢ Subtract near multiples of 10 and 100 by rounding and adjusting ➢ Difference between		Add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
4	➢ Subtract multiples of 10s , 100s, 1000s ➢ Fluency of 2 digit subtract 2 digit ➢ Partition second number to subtract ➢ Decimal subtraction from 10 or 1 ➢ Difference between ➢ Subtract near multiples by rounding and adjusting ➢ Difference between		Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	 Dienes equipment. Can also be used For exchanging.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate
5	➢ Subtract multiples of 10s , 100s, 1000s, tenths, ➢ Fluency of 2 digit - 2 digit including with decimals ➢ Partition second number to subtract ➢ Difference between ➢ Adjust numbers to subtract ➢ Difference between		Add and subtract numbers mentally with increasingly large numbers		Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction
6	➢ Subtract multiples of 10s , 100s, 1000s, tenths, hundredths ➢ Fluency of 2 digit - 2 digit including with decimals ➢ Partition second number to subtract ➢ Use number facts bridging and place value ➢ Adjust numbers to subtract ➢ Difference between		Perform mental calculations, including with mixed operations and large numbers		Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Multiplication

Year	Foundations	You need to know it!	Quick jottings or work it out in your head	Developing conceptual understandings	Written Methods.
1	➢ Count in 2s ➢ Count in 10s ➢ Doubles up to 10 ➢ Count in 5s ➢ Double multiples of 10 ➢ Count in 2s, 5s and 10s	**Count in multiples of twos, fives and tens**	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher		
2	➢ 2 x table ➢ 10 x table ➢ Doubles up to 20 and multiples of 5 ➢ 5 x table ➢ Count in 3s ➢ 2 x, 5 x and 10 x tables	**Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.**	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
3	➢ Review 2x, 5x and 10x ➢ 4x table ➢ Double two digit numbers ➢ 8 x table ➢ 3 x table ➢ 6 x table or review others	**Recall and use x and ÷ facts for the 3, 4 and 8 times tables.**	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods		Write and calculate mathematical statements for ÷ using the x tables they know progressing to formal written methods.
4	➢ 4x, 8x tables ➢ 10 times bigger ➢ 3x, 6x and 12x tables ➢ Double larger numbers and decimals ➢ 3x, 9x tables ➢ 11x, 7 x tables	**Recall x and ÷ facts for x tables up to 12 x 12.**	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations		Multiply two-digit and three-digit numbers by a one-digit number using formal written layout 243 x 6 = 2058
5	➢ 4x, 8x tables ➢ 100, 1000 times bigger ➢ 3x, 6x and 12x tables ➢ 10, 100, 1000 times smaller ➢ Double larger numbers and decimals ➢ 3x, 9x tables ➢ 11x , 7 x tables ➢ Partition to multiply mentally ➢ 6x, 12 x tables	**Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)**	Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers establish whether a number up to 100 is prime		Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers 243 x 36 = 7290 + 1458 = 8748
6	➢ Multiplication facts up to 12 x 12 ➢ Partition to multiply mentally ➢ Double larger numbers and decimals ➢ Multiplication facts up to 12 x 12 ➢ Partition to multiply mentally ➢ Double larger numbers and decimals		Perform mental calculations, including with mixed operations and large numbers		

Division

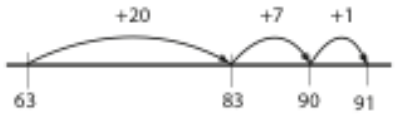
Year	Foundations	You need to know it!	Quick jottings or work it out in your head	Developing conceptual understandings	Written Methods.
1	➢ Count back in 2s ➢ Count back in 10s ➢ Halves up to 10s ➢ Count back in 5's ➢ Halve multiples of 10 ➢ How many 2's? 5's? 10's?	**Count in multiples of twos, fives and tens**	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	6 ÷2 = 3 by sharing into 2 groups and by grabbing groups of 2  How many 2s? 	
2	➢ Division facts (2 x table) ➢ Division facts (10 x table) ➢ Halves up to 20 ➢ Division facts (5 x table) ➢ Count back in 3s ➢ Review division facts (2x, 5x, 10x table)	**Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.**	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	15 ÷ 3 = 5 in each group (sharing)   Link to fractions 15 ÷ 3 = 5 groups of 3 (grouping)   10 ÷2 = 5  Use language of division linked to tables  How many 2s? 	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
3	➢ Review division facts (2x, 5x, 10x table) ➢ Division facts (4 x table) ➢ Halve two digit numbers ➢ Division facts (8 x table) ➢ Division facts (3 x table) ➢ Division facts (6 x table) or review others	**Recall and use x and ÷ facts for the 3, 4 and 8 times tables**	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	Grouping using partitioning 43 ÷ 3 If I know 10 x 3 …    Use language of division linked to tables  How many 3s? 	Write and calculate mathematical statements for ÷ using the x tables they know progressing to formal written methods.
4	➢ Division facts (4x, 8x tables) 10 times smaller ➢ Division facts (3x, 6 x, 12x tables) ➢ Halve larger numbers and decimals ➢ Division facts (3x, 9x tables) ➢ Division facts (11x, 7x tables) ➢ Division facts (6x, 12x tables)	**Recall x and ÷ facts for x tables up to 12 x 12.**	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations	Grouping using partitioning 196 ÷ 6 If I know 3 x 6 … then 30 x 6…  Use language of division linked to tables.  'Chunking up' on a number line 196 ÷ 6 = 32 r 4 	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout 
5	➢ Division facts (4x, 8x tables) ➢ 100, 1000 times smaller ➢ Division facts (3x, 6 x, 12x tables) ➢ Partition to divide mentally ➢ Halve larger numbers and decimals ➢ Division facts (3x, 9x tables) ➢ 100, 1000 times smaller ➢ Review division facts (11x, 7x tables) ➢ Partition decimals to divide mentally ➢ Review division facts (6x, 12x tables) Halve larger numbers and decimals	**Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers**	Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	92 ÷ 6 using place value counters or dienes to support written method  Exchange one 100 for ten 10s  19 tens into groups of 6 3 groups so that is 30 x 6, exchange remaining 10 for ten 1s  So 192 ÷ 6 = 32 	Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context 194 ÷ 6 the  192 ÷ 6 = 32
6	➢ Division facts (up to 12 x 12) ➢ Partition to divide mentally ➢ Halve larger numbers and decimals ➢ Division facts (up to 12 x 12) ➢ Partition to divide mentally ➢ Halve larger numbers and decimals		Perform mental calculations, including with mixed operations and large numbers	Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context  Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context 	

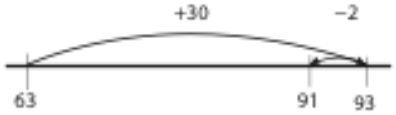
Compact vertical

23454 + 596 23.7 + 48.56

$$\begin{array}{r} 23454 \\ +\ \ 596 \\ \hline 24050 \\ {\scriptstyle 1\ \ 1\ \ 1} \end{array} \qquad \begin{array}{r} 23.70 \\ +\ 48.56 \\ \hline 72.26 \\ {\scriptstyle 1\ \ 1} \end{array}$$

Using a number line: 63 + 28 = 91





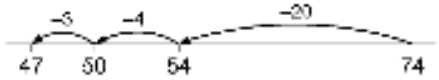
Decomposition

2748 – 364 72.5 – 45.73

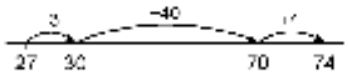
$$\begin{array}{r} {\scriptstyle 6\ \ 1} \\ 2\not{7}48 \\ -\ \ 364 \\ \hline 2384 \end{array} \qquad \begin{array}{r} {\scriptstyle 6\ \ 1\ \ 1\ \ 1\ \ 4\ \ 1} \\ 7\not{2}.\not{5}0 \\ -\ 45.73 \\ \hline 26.77 \end{array}$$

Using a number line: 74 - 27 = 47

'Taking away'



'Counting on'



LOOK AT THE NUMBERS – can you solve it in your head, with jottings or using written method?

Long multiplication

5172 x 38

$$\begin{array}{r} 5172 \\ \times\ \ 38 \\ \hline 155160 \\ +\ \ 41376 \\ \hline 196536 \\ {\scriptstyle 1} \end{array}$$

Using known multiplication facts:

43 x 6 = (40 x 6) + (3 x 6) = 258

Division (Short & Long)

564 ÷ 13

$$13\overline{)\,5\,6\,^{4}4} \quad 4\ 3\ \text{r}\ 5$$

Known multiplication facts:
13, 26, 39, 52, 65, ...
10 x 13 = 130, 20 x 13 = 260

564 ÷ 13

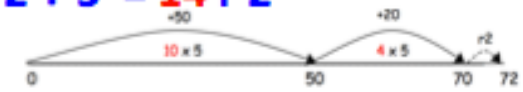
= 43 r 5 = $43\frac{5}{13}$ = 43.4 (to 1dp)

$$13\overline{)\,5\,6\,4.0\,0\ldots} \quad 4\ 3.3\ 8\ldots$$

$$\begin{array}{r} 5\ 2 \\ \hline 4\ 4 \\ -\ 3\ 9 \\ \hline 5\ 0 \\ -\ 3\ 9 \\ \hline 1\ 1\ 0 \\ -\ 1\ 0\ 4 \\ \hline 6 \end{array}$$

Using a number line:

72 ÷ 5 = 14 r 2

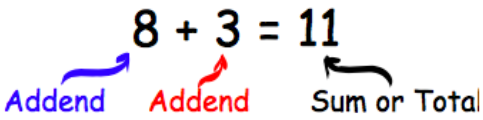


Addition is ...

... bringing two or more numbers (or things) together to make a new total.

The numbers to be added together are called the "**Addends**":

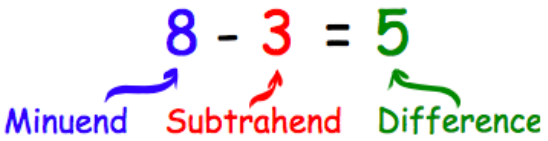
Addition:



Subtraction is ...

... taking one number away from another.

Subtraction:



Minuend – Subtrahend = Difference

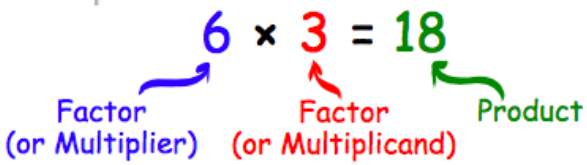
Minuend: The number that is to be subtracted from.
Subtrahend: The number that is to be subtracted.
Difference: The result of subtracting one number from another.

Multiplication is ...

... (in its simplest form) **repeated addition**.

Here we see that 6+6+6 (three 6s) make 18:

Multiplication:



It can also be said that 3+3+3+3+3+3 (six 3s) make 18

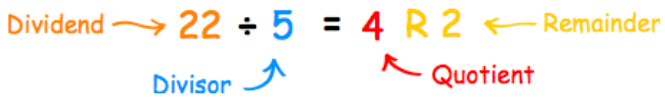
Division is ...

... splitting into equal parts or groups. It is the result of "fair sharing".

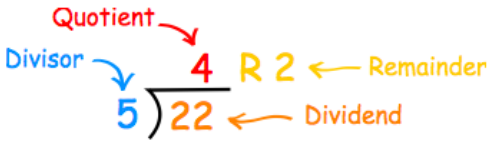
Division has its own special words to remember.

Let's take the simple question of **22 divided by 5**. The answer is **4**, with **2** left over.

Here we see the important words:



Which can also be in this form:



Glossary of Terms

2-digit number– a number with 2 digits like 23, 45, 12 or 60

3-digit number – a number with 3 digits like 123, 542, 903 or 561

Addition facts – knowing that 1+1 = 2 and 1+3 = 4 and 2+5 = 7. Normally we only talk about number facts with totals of 20 and under.

Array - An array is an arrangement of a set of numbers or objects in rows and columns –it is mostly used to show how you can group objects for repeated addition or subtraction.

Bead String/Bar – a string with (usually 100) beads on, grouped by colour in tens. The bead string is a good bridge between a number track and a number line as it maintains the cardinality of the numbers whilst beginning to develop the concepts of counting 'spaces' rather than objects.

Bridging – when a calculation causes you to cross a 'ten boundary' or a 'hundred boundary' e.g. 85 + 18 will bridge 100.

Compact vertical – the name of the recommended written method for addition whereby the numbers are added in columns, 1s first then 10s and so on. Where the total exceeds 10, the ten 1s are exchanged for a 10 and written below the answer line. Sometimes referred to as 'carrying'.

Concrete apparatus – objects to help children count and calculate– these are most often cubes (multilink) but can be anything they can hold and move including Cuisenaire rods, Dienes rods (hundreds, tens and units blocks), straws, Numicon, Place Value counters and much more.

Count all – when you add by counting all the items/objects e.g. to add 11 and 5 you would count out 11, then count out 5, then put them together and count them all to get 16.

Count on – when you add (or sometimes subtract) by counting onwards from a given number. E.g. to add 11 and 5 you would count on 5 from 11 i.e. 12, 13, 14, 15, 16

Decimal number – a number with a decimal point e.g. 2.34 (said as two point three four)

Decomposition – the name of the recommended written method for subtraction whereby the smaller number is subtracted from the larger, 1s first then 10s and so on. Where the subtraction cannot be completed as the second number is larger than the first, a 10 is exchanged for ten 1s to facilitate this. This is the traditional 'borrowing' form of column method, which is different to the 'payback' method.

Dienes Rods (or Base 10) – this is a set of practical equipment that represents the numbers to help children with place value and calculation. The Dienes rods show 1s, 10s, 100s and 1000s as blocks of cubes that children can then combine. Dienes rods do not break up so the child has to 'exchange' them for smaller or larger blocks where necessary.

Difference – the gap between numbers that is found by subtraction e.g. 7-5 can be read as '7 take away 5' or as the 'difference between 7 and 5'

Dividend – the number being divided in a calculation

Divisor – the smaller number in a division calculation.

Double – multiply a number by 2

Efficient Methods – the method(s) that will solve the calculation most rapidly and easily

Equals - is worth the same as (be careful not to emphasise the use of = to show the answer)

Exchanging – Swapping a '10' for ten '1s' or a '100' for ten '10s' or vice versa (used in addition and subtraction when 'moving' 'ten' or a 'hundred' from its column into the next column and splitting it up). Heavily relied upon for addition and subtraction of larger numbers. Skills in this can be built up practically with objects, then Dienes rods/base 10, then place value counters before relying on a solely written method.

Expanded Multiplication – a method for multiplication where each stage is written down and then added up at the end in a column

Factor – a number that divides exactly into another number, without remainder

Grid method – a method for multiplying two numbers together involving partitioning and multiplying each piece separately.

Grouping – an approach to division where the dividend is split into groups of the size of the divisor and the number of groups created are then counted.

Half - a number, shape or quantity divided into 2 equal parts

Halve – divide a number by 2

Integer - a whole number (i.e. one with no decimal point)

Inverse – the opposite operation. For example, addition is the inverse of subtraction and multiplication is the inverse of division.

Known Multiplication Facts – times tables and other number facts that can be recalled quickly to support with larger or related calculations e.g. if you know 4x7 then you also know 40 x 70, 4 x 0.7 etc.

Long Division – formal written of division where the remainders are calculated in writing each time (extended version of short division)

Long Multiplication – formal written method of column multiplication

Multiple - a number which is an exact product of another number i.e. a number which is in the times table of another number

Number bonds – 2 numbers that add together to make a given total, e.g. 8 and 2 bond to 10 or 73 and 27 bond to 100

Number line – a line either with numbers or without (a blank numberline).
The number line emphasises the continuous nature of numbers and the existence of 'in-between' numbers that are not whole. It is based around the gaps between numbers.
Children use this tool to help them count on or count back for addition of subtraction. As they get older, children will count in 'jumps' on a number line e.g. to add 142 to a number they may 'jump' 100 and then 40 and then 2. The number line is sometimes used in multiplication and division but can be time consuming.

Number track – a sequence of numbers, each inside its own square. It is a simplified version of the number line that emphasises the whole numbers.

Numicon – practical maths equipment that teaches children the names and values of numbers 1-10 initially but them helps them with early addition, subtraction, multiplication and division. Numicon is useful for showing the real value of a number practically.

One-Step Calculation – a calculation involving only one operation e.g. addition. Usually the child must decide what that operation is.

Partition – split up a larger number into parts, such as the hundreds, tens and units e.g. 342 can be partitioned into 300 and 40 and 2

Place Value – the value of a digit created by its position in a number e.g. 3 represents thirty in 234 but three thousand in 3567

Recombine – for addition, once you have partitioned numbers into hundreds, tens and units then you have to add then hundreds together, then add the tens to that total, then add the units to that total

Remainder – a whole number left over after a division calculation

Repeated addition – repeatedly adding groups of the same size for multiplication

Scaling – an approach to multiplication whereby the number is 'scaled up' by a factor of the multiplier e.g. 4 x 3 means 4 scaled up by a factor of 3.

Sharing – an approach to division whereby the dividend is shared out into a given number of groups (like dealing cards)

Short Division - traditional method for division with a single digit divisor (this is a compact version of long division, sometimes called 'bus stop')

Significant digit – the digit in a number with the largest value e.g. in 34 the most significant digit is the 3, as it has a value of '30' and the '4' only has a value of '4'

Single digit – a number with only one digit. These are always less than 10.

Sum – the total of two or more numbers (it implies addition). Sum should not be used as a synonym for calculation.

Two-step calculation - a calculation where two different operations must be applied e.g. to find change in a shop you will usually have to add the individual prices and then subtract from the total amount. Usually the child has to decide what these two operations are and the order in which they should be applied.