You Can … Achieve… Succeed… Enjoy.

Youth Challenge Primary
Part of Bolton Impact Trust

Calculations Progression Overview

	+	-	Skills	x	÷	Skills
Y2	Vertical partitioning method using place value grid and counters eg: 25 +24 49 Start with ones and move on to compensating if ready Extend to compact column method if have sound understanding of place value. Access strategies • Counters • Numberlines • Hundred Square 	Vertical partitioning method using place value grid and counters eg: 35 - 24 11 Start with ones and move on to compensating if ready Extend to compact column method if have sound understanding of place value. Access strategies • Counters • Numberlines • Hundred Square 	• Read and write numbers to at least 100 in digits & words • Recognise the place value of each digit in a two-digit number (tens, ones) • Partition numbers in different ways (e.g. 23 = 20 + 3 and 23 = 10 + 13) (counters) • Compare and order numbers from 0 up to 100; use <, > and = signs • Find 1 or 10 more or less than a given number • Describe and extend simple sequences involving counting on or back in different steps • Use place value and number facts to solve problems • Show that addition of two numbers can be done in any order and subtraction of one number from another cannot • Understand subtraction as take away and difference (how many more, how many less/fewer) • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Add and subtract numbers using objects, pictures, and mentally, including: (Counters) two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • Solve problems with addition and subtraction including with missing numbers: (Counters)	Extend use of arrays to develop concepts and links between x and ÷ Link grouping to counting/repeated addition Formalise recording of year 1 strategies Move onto multiplication using counters. 12 x 3 = 36 Access strategies • Counters • Numicon • Multiplication Grids	Extend use of arrays to develop concepts and links between x and ÷ Link division to number of counts/multiples of a number/repeated subtraction Formalise recording of year 1 strategies Access strategies • Counters • Numicon • Multiplication Grids	• Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • Understand the connection between the 10 multiplication table and place value • Understand multiplication as repeated addition • Understand division as sharing and grouping and that a division calculation can have a remainder • Show that multiplication of two numbers can be done in any order and division of one number by another cannot • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Derive and use doubles of simple two-digit numbers (numbers in which the ones total less than 10) • Find halves of simple two-digit even numbers (numbers in which the tens are even) • Calculate mathematical statements for multiplication using repeated addition) and division within the multiplication tables and write them using the multiplication (×), (÷) and (=) signs • Solve problems involving multiplication and division (including those with remainders), using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts (Counters and Numicon) • Find $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a set of objects or quantity

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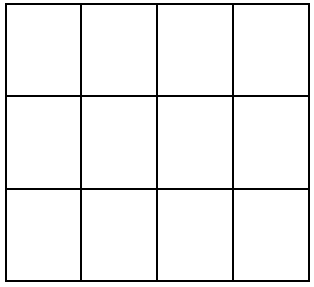
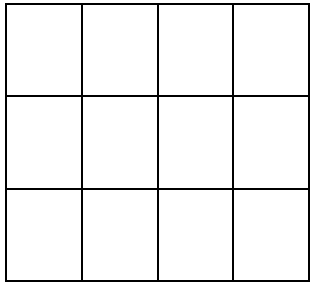
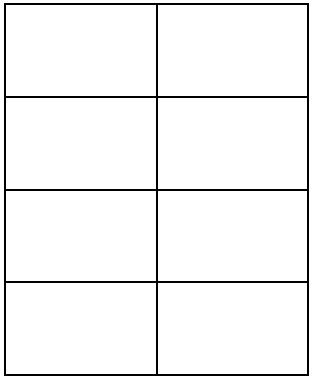
	+	-	Skills	x	÷	Skills
Y3	Compact column addition (numbers up HTO including 1 decimal place) 625 + 48 673 Extend to decimals in the context of money starting with multiples of 10p. £3.20 + £1.90 £5.10 1 Use counters to support with decimal addition if needed  Access strategies • Counters • Hundred Square	Compact column subtraction (numbers up HTO including 1 decimal place) 6 8 1 ~~7~~ ~~1~~ 94 - 148 546 Extend to decimals in the context of money starting with multiples of 10p. £4.50 -£2.20 £2.30 Use counters to support with decimal subtraction if needed  Access strategies • Counters • Hundred Square	• Count up and down in tenths • Read and write numbers up to 1000 in digits and words • Identify the value of each digit to one decimal place • Partition numbers in different ways (e.g. 146 = 100+ 40+6 and 146 = 130+16) (Counters) • Compare and order numbers up to 1000 • Compare and order numbers with one decimal place • Find 1, 10 or 100 more or less than a given number • Describe and extend number sequences involving counting on or back in different steps • Select a mental strategy appropriate for the numbers involved in the calculation • Understand and use take away and difference for subtraction, deciding on the most efficient method • Recall/use addition/subtraction facts for 100 (multiples of 5 and 10) • Derive and use addition and subtraction facts for 100 • Derive and use addition and subtraction facts for multiples of 100 totalling 1000 • 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 column addition and subtraction • Estimate the answer to a calculation and use inverse operations to check answers • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Grid method (TUxU) 23 x 8 = 184 x 20 3 8 160 24 (160+24) Use counters to support with multiplication if needed Access strategies • Counters • Multiplication Grids	Develop reliable written methods within known multiplication tables. 21 3)63  Access strategies • Counters • Multiplication Grids	• Count from 0 in multiples of 4, 8, 50 and 100 • Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer • Recall/use addition/subtraction facts for 100 (multiples of 5 and 10) • Understand that division is the inverse of multiplication and vice versa • Understand how multiplication and division statements can be represented using arrays • Understand division as sharing and grouping and use each appropriately • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Derive and use doubles of all numbers to 100 and corresponding halves • Derive and use doubles of all multiples of 50 to 500 • 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 and progressing to formal written methods • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Solve problems, including missing number problems, involving multiplication and division (and interpreting remainders), including positive integer scaling problems and correspondence problems in which objects are connected to m objects • Find fractions of numbers

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	+	-	Skills	x	÷	Skills
Y4	Compact column addition (numbers up ThHTO including 2 decimal place) 6258 + 2748 9006 1 1 1 67.82 + 45.33 113.15 1 1 Use counters to support with decimal addition if needed Access strategies • Counters • Hundred Square	Compact column subtraction (numbers up ThHTO including 2 decimal place) 8 1 7946 - 1482 6464 5 1 6767 - 49.43 18.24 Use counters to support with decimal subtraction if needed Access strategies • Counters • Hundred Square	• Count backwards through zero to include negative numbers • Count up and down in hundredths • Read and write numbers to at least 10 000 • Read and write numbers with up to two decimal places • Recognise the place value of each digit in a four-digit number • Identify the value of each digit to two decimal places • Order and compare numbers beyond 1000 • Order and compare numbers with the same number of decimal places up to two decimal places • Find 0.1, 1, 10, 100 or 1000 more or less than a given number • Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps • Recall and use addition and subtraction facts for 100 • Recall and use +/- facts for multiples of 100 totalling 1000 • Derive and use addition and subtraction facts for 1 and 10 (with 1 d.p.) • Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place • Add and subtract numbers with up to 4 digits and decimals with one decimal place using the formal written methods of column addition and subtraction where appropriate • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why • Solve addition and subtraction problems involving missing numbers	Grid method (HTOxO) 346 x 9 = 3114 x 300 40 9 9 2700 360 45 2700 + 360 45 3114 Once secure with all times tables and grid method/partitioning, introduce short multiplication for HTO x U (ie: 237 x 4 948 1 2 Use counters to support with this method if needed Access strategies • Counters • Multiplication Grids	Becoming more fluent in using formal methods of short division within known multiplication tables. 204 4)816 Access strategies • Counters • Multiplication Grids	• Count in multiples of 6, 7, 9, 25 and 1000 • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer • Recall multiplication and division facts for multiplication tables up to 12 × 12 • Use partitioning to double or halve any number, including decimals to one decimal place • 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 • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, division (including interpreting remainders), integer scaling problems and harder correspondence problems such as n objects are connected to m objects

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	+	-	Skills	x	÷	Skills
Y5	Compact column addition (numbers up to Millions including decimals to 2 decimal places) Access strategies • Counters • Hundred Square	Compact column addition (numbers up to Millions including decimals to 2 decimal places) Access strategies • Counters • Hundred Square	• Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Count forwards and backwards in decimal steps • Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • Read, write, order and compare numbers with up to 3 decimal places • Identify the value of each digit to three decimal places • Identify represent and estimate numbers using the number line • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • Solve number and practical problems that involve all of the above • Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place) • Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places) • Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places • Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (column addition and subtraction) • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Solve addition and subtraction problems involving missing numbers	Compact multiplication (ThHTO x O) Long multiplication or Grid method Multiplication (ThHTO x TO) 3241 x 23 = 74,543 x 3000 200 40 1 20 60000 4000 800 20 3 9000 600 80 3 60000 4000 9000 800 + 400 80 20 3 74,543 Access strategies • Counters • Multiplication Grids	Short division ThHTO ÷ O 3123 3)9369 Access strategies • Counters • Multiplication Grids	• Multiply/divide whole numbers and decimals by 10, 100 & 1000 • Describe and extend number sequences including those with multiplication/division steps and where the step size is a decimal • Find 0.01, 0.1, 1, 10, 100, 100 and other powers of 10 more or less than a given number • Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • Recognise and use square (^{2}) and cube (^{3}) numbers • Use partitioning to double or halve any number, including decimals to two decimal places • Multiply & divide numbers mentally • Solve problems involving multiplication and division • 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 • 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 • Use estimation/inverse to check answers to calculations; • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

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	+	-	Skills	x	÷	Skills
Y6	Compact column addition (numbers up to Ten Millions including decimals to 3 decimal places) Access strategies • Counters • Hundred Square	Compact column addition (numbers up to Ten Millions including decimals to 3 decimal places) Access strategies • Counters • Hundred Square	• Count forwards or backwards in steps of integers, decimals, powers of 10 • Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Identify, represent and estimate numbers using the number line • Order and compare numbers including integers, decimals and negative numbers • Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Solve number and practical problems that involve all of the above • Select a mental strategy appropriate for the numbers in the calculation • Recall and use addition and subtraction facts for 1 (with decimals to two decimal places) • Perform mental calculations including with mixed operations and large numbers and decimals • Add & subtract whole numbers and decimals using formal written methods (column addition and subtraction) • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Solve problems involving all four operations, including those with missing numbers	Long multiplication (ThHTO x TO) 5672 x 23 113,440 17,016 130,456 Decimals x by as single unit 3.42 x 8 = 27.36 x 3 0.4 0.02 8 24 3.2 0.16 Access strategies • Counters • Multiplication Grids	Short division ThHTO by TO 140r4 25)3504 Short division with decimal answers 205. 75 4)823.00 Access strategies • Counters • Multiplication Grids	• Describe and extend number sequences including those with multiplication and division steps, inconsistent steps, alternating steps and those where the step size is a decimal • Identify common factors, common multiples and prime numbers • Use partitioning to double or halve any number • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Multiply one-digit numbers with up to two decimal places by whole numbers • Divide numbers up to 4 digits by a two-digit whole number using the formal written methods of short or long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Use written division methods in cases where the answer has up to two decimal places • Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations • Solve problems involving all four operations, including those with missing numbers