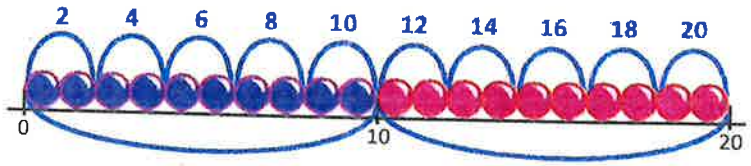
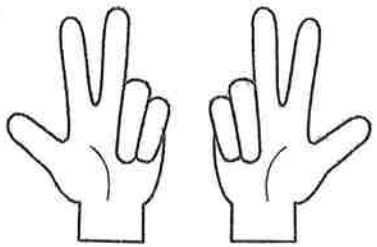
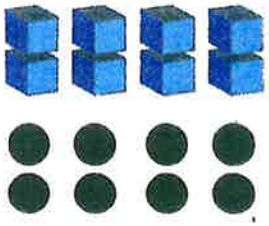
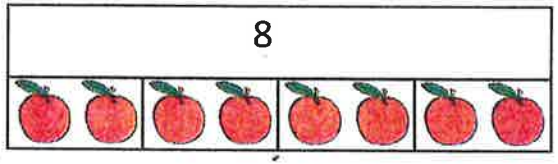
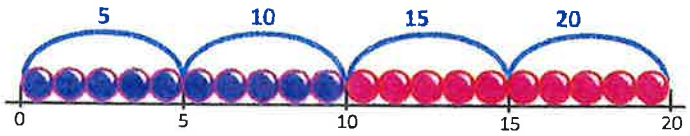
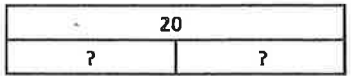
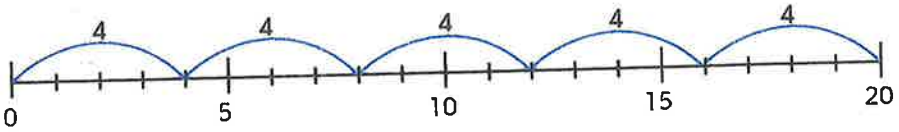
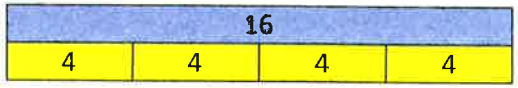
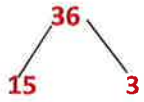
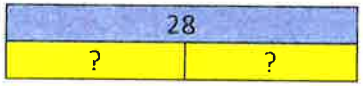
Y1	National Curriculum	Multiplication	Division	Models and images	Maths Talk
	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Recognise, find and name a half as one of two equal parts of an object, shape or quantity Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Begin to count in 2s and 10s 'clever counting'  Begin to say what three 10s are by counting in 10s or what four 2s are by counting in 2s, etc. Double numbers to 10 *(Numicon is an excellent resource for doubles/halves)* Find half of even numbers to 12 and know it is hard to halve odd numbers Find half of even numbers by sharing  Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number.    **Grouping:** division is the inverse of multiplication so presented through **grouping** (Image arrays). E.g. use sets of objects to find the answers to: '*how many towers of 3 can I make with 12 cubes?*' Sharing: begin to find a quantity by sharing e.g. half of 16 cubes (share out one at a time)	Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line 100 grid Bar model	Clever counting (2s, 5s 10s) Doubling Halving

Y2	National Curriculum	Addition	Subtraction	Models and images	Maths Talk
	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd & even numbers. Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. 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. Recognise, find, name and write fractions 3 1, 4 1, 4 2 and 4 3 of a length, shape, set of objects or quantity.	Count in 2s, 5s and 10s Begin to count in 3s. Using fingers, say where a given number is in the 2s, 5s or 10s count. E.g. *'8 is the fourth number when I count in twos'.*  Begin to understand that multiplication is repeated addition and to use arrays (E.g. 3 x 4 is three rows of 4 dots) Relate division to multiplication through **grouping**. (E.g. how many groups of five in fifteen? How many towers of 5 cubes can I make with 20 cubes? ☐ x 5 = 20 and 20 ÷ 5 = ☐)  Begin to learn the 2x, 3x, 5x and 10x tables, seeing these as 'lots of', e.g. 5 lots of 2, 6 lots of 2, 7 lots of 2, etc. Double numbers up to 20 Begin to double multiples of 5 to 100 Begin to double two-digit numbers less than 50 with 1s digits of 1, 2, 3 4 or 5 Halve numbers to 20 Begin to halve numbers to 40 and multiples of 10 to 100 half of 20 is...  Double 7 = 14  Find ½, 1/3, ¼ and ¾ of a quantity of objects and of amounts (whole number answers) Begin to find half or a quarter of a quantity by sharing. (E.g. ¼ of 16 cubes share them out into 4 piles)	Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line 100 grid Bar model Arrays	Clever counting (2s, 5s 10s, 3s) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations'

Y3	National Curriculum	Multiplication	Division	Models and images	Maths Talk
	Recall and use multiplication and division facts for the 3, 4 and 8 (2,5,10 *Y2*) multiplication 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 and progressing to formal written methods ? solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	Know by heart all the multiplication and division facts derived from the 2x, 3x, 4x, 5x, 8x and 10x tables   Multiply and divide whole numbers by 10 and 100 (Divide to give whole number answers i.e. not 743 ÷ 10) 370 ÷ 10 = 37 etc. 1000s | 100s | 10s | 1s 3 | 7 | 0 3 | 7 Recognise that multiplication is commutative. (E.g. 3 x 8 = 8 x 3) Recognise that division is not commutative. (E.g. 15 ÷ 5 ≠ 5 ÷ 15) Use place value and number facts in mental multiplication and division. (E.g. 30 x 5 is 15 x 10 & 84 ÷ 4 is half of 42) Double numbers up to 50 Halve even numbers to 100, halve odd numbers to 20.    Find unit fractions of quantities and begin to find non-unit fractions of quantities	Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays	Clever counting (2s, 5s 10s, 3s halves, quarters) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations'
		Partition teen numbers & 2-digit numbers to multiply by a single-digit number. E.g. 3 x 14 = 3 x 10 = 30 3 x 4 = 12 add to find 3 x 14 = 42 **Written method - multiplication** Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' single digit numbers. X | 20 | 4 | = 3 | 60 | 12 | 72	Perform divisions within the tables including those with remainders, e.g. 38 ÷ 5 = 7 r3 (write remainders as whole numbers). Divide larger numbers mentally by subtracting the tenth multiple, including those with remainders. (Efficient chunking, answers up to teen numbers) E.g. 57 ÷ 3 = We know 10 x 3 = 30 57 – 30 = 27 We know 9 x 3=27 So 57 ÷ 3 = 19		

Y4	National Curriculum	Multiplication	Division	Models and images	Maths Talk
	Recall multiplication and division facts for multiplication tables up to 12 × 12. Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 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. Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. Calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths & hundredths.	Know by heart all the multiplication and division facts up to 12 x 12/144 ÷ 12. Recognise factors up to 12 of two-digit numbers. Multiply and divide whole numbers by 10, 100 to give whole number answers or answers with one decimal place, e.g. 5632 ÷ 10 = 563.2, etc. Multiply multiples of 10, 100, 1000 by single digit numbers. (E.g. 300 x 6 or 4000 x 8 by knowing 4x8=32 then multiplying by 1000, Divide multiples of 100 by 1-digit numbers using division facts. (E.g. 3200 ÷ 8 = 400) Use understanding of place value and number facts in mental multiplication. (E.g. 36 x 5 is half of 36 x 10 and 50 x 60 = 3000) Use place value and number facts in mental division. (E.g. 245 ÷ 20 is double 245 ÷ 10) Find doubles to double 100 and beyond using partitioning Find halves of even numbers to 200 and beyond using partitioning Begin to double amounts of money. (E.g. £35.60 doubled = £71.20.) Begin to halve amounts of money. (E.g. Half of £52.40 = £26.20) Begin to reduce fractions to their simplest forms. E.g. $^{12}/_{15} = {}^{4}/_{5}$ Find unit and non-unit fractions of larger amounts.		Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays Fraction wall Fraction strips	Counting on and back in multiples Clever counting (all tables) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations' Factors fit into numbers Counting in fractions Prime numbers

1000s	100s	10s	1s	0.1s ($^{1}/_{10}$)
5	6	3	2	
	5	6	3	2

34	
172	172

226

400 40 12

Partition 2-digit numbers to multiply by a single-digit number mentally. (E.g. 4 x 24 as 4 x 20 and 4 x 4)
Multiply near multiples using rounding. (E.g. 33 x 19 as 33 x 20 – 33)
Written method: Grid method to multiply a 2-digit number by a number between 10 and 20 by partitioning:

x	20	9	
30	600	270	870
4	80	36	116
			986

Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate. (E.g. 156 ÷ 6 is 20 + 6 as 20x6=120 and 6x6=36)
Written method: Efficient chunking to divide a 2-digit or a 3-digit-number by a single-digit number.
Give remainders as whole numbers.
E.g.
86 ÷ 3 = 28 r 2
□ x 3 = 86
20 x 3 = 60
26
8 x 3 = 24
2

Y5	National Curriculum	Multiplication	Division	Models and images	Maths Talk
	Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19. 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. Multiply and divide numbers mentally, drawing upon known facts. 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. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000.	Know by heart all the multiplication and division facts up to 12 x 12/144 ÷ 12. Use knowledge of factors and multiples in multiplication. (E.g. 43 x 6 is double 43 x 3, and 28 x 50 is ½ of 28 x 100 = 1400) Use knowledge of multiples and factors, also tests for divisibility in mental division. (E.g. 246 ÷ 6 is 123 ÷ 3 and we know that 525 divides by 25 and by 3) Multiply and divide whole numbers and one-and two-place decimals by 10, 100 to give whole answers with 1, 2 or 3-decimal places, e.g. 4.302 x 1000 =		Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays Fraction wall Fraction strips	Counting on and back in multiples Clever counting (all tables) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations' Factors fit into numbers Counting in fractions Prime numbers Prime factors Composite (non-prime) numbers

100,000s	10,000s	1000s	100s	10s	1s	0.1s ($^1/_{10s}$)	0.01s ($^1/_{100s}$)	0.001s ($^1/_{1000s}$)
		4	3	0	4 2	3	0	2

Use knowledge of place value and rounding in mental multiplication. (E.g. 67 x 199 as 67 x 200 – 67)
Use doubling and halving as a strategy in mental multiplication and division (E.g. 34 ÷ 5 is (34 ÷ 10) x 2) (E.g. 58 x 5 = half of 58 x 10, and 34 x 4 is 34 doubled twice, etc.
Double amounts of money by partitioning. (E.g. £37.45 doubled = £37 doubled (£74) plus 45p doubled (90p) £74.90)

16.7	
8.35	8.35

Halve amounts of money by partitioning. (E.g. Half of £75.40 = half of £75 (37.50) plus half of 40p (20p) which is £37.70)

Partition 2-digit numbers, including decimals, to multiply by a single-digit number mentally. (E.g. 6 x 27 as 6 x 20 (120) plus 6 x 7 (42) making 162 or 6.3 x 7 as 6 x 7 plus 0.3 x 7)
Reduce fractions to their simplest form.
Find unit and non-unit fractions of large amounts.
Turn improper fractions into mixed numbers and vice versa.
Choose the most efficient method in any given situation
Use rounding and approximation to estimate and check answers

	Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}). Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal fraction.	**Written method:** Grid multiplication/ introduce vertical written algorithm (ladder) to multiply a 1-digit number by a number with up to 4 digits, e.g. 936 x 27 = 253 x 6 = 253 X 6 1200 300 18 1518 ***Choose the most efficient method in any given situation*** Find simple percentages of amounts (e.g. 10%, 5%, 20%, 155 and 50%) Begin to multiply fractions and mixed numbers by whole numbers ≤ 10, e.g. $4 \times {}^2/_3 = {}^8/_3 = 2^2/_3$. **NB: grid method is default method for all children**	Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate. (E.g. 96 ÷ 6 is 10 + 6, as 10 × 6 = 60 and 6 × 6 = 36; 312 ÷ 3 is 100 + 4 as 100 x 3 = 300 and 4 x 3 = 12) **Written methods:** Efficient chunking, e.g. 465 ÷ 6 = 60 (x10) 465 ÷ 6 = $77^3/_6$ = **77½** 120 -420 = 6 x **70** 180 45 240 42 = 6 x **7** 300 3 360 420 Short division (bus stop) to divide a number with up to 4 digits by a number ≤12. 1 2 6 4 6 ⟌ $7^1 5^3 8^2 4$ Give remainders as whole numbers or as fractions. **NB: Efficient chunking method is default method for all children**	Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays Fraction wall Fraction strips	Counting on and back in multiples Clever counting (all tables) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations' Factors fit into numbers Counting in fractions Prime numbers Prime factors Composite (non-prime) numbers

x	900	30	6	
20	18000	600	120	18720
7	6300	210	42	6552
				25272

Y6	National Curriculum	Addition	Subtraction	Models and images	Maths Talk
	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. 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. Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. Perform mental calculations, including with mixed operations and large numbers. Identify common factors, common multiples and prime numbers. Use their knowledge of the order of operations to carry out calculations involving the 4 operations.	Know by heart all the multiplication and division facts up to 12 x 12/144 ÷ 12. Multiply (whole numbers and decimals with up to three places) and divide (whole numbers) by powers of 10 to give whole number answers or answers with up to three decimal places. E.g. 47,310 ÷ 1000		Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays Fraction wall Fraction strips	Counting on and back in multiples Clever counting (all tables) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations' Factors fit into numbers Counting in fractions Prime numbers Prime factors Composite (non-prime) numbers

100,000s	10,000s	1000s	100s	10s	1s	0.1s ($^1/_{10s}$)	0.01s ($^1/_{100s}$)	0.001s ($^1/_{1000s}$)
	4	7	3	1 4	6 7	3	1	6

Identify common factors, common multiples and prime numbers and use factors in mental multiplication. (E.g. 326 x 6 is 652 x 3 which is 1956) and division. (E.g. 438 ÷ 6 is 219 ÷ 3 which is 73)

Use tests for divisibility to aid mental calculation.

Use doubling and halving:

- As mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25 (E.g. 28 x 25 is ¼ of 28 x 100 = 700)
- As mental division strategies, e.g. to divide by 2, 4, 8, 5, 20 and 25. (E.g. 628 ÷ 8 is halved three times: 314, 157, 78.5)
- Double decimal numbers with up to 2 places using partitioning; *e.g. 36·73 doubled is double 36 (72) plus double 0·73 (1·46)*
- Halve decimal numbers with up to 2 places using partitioning; *e.g. Half of 36·86 is half of 36 (18) plus half of 0·86 (0·43)*

36.73

72 + 1.46 = 73.46

36.86

18 + 0.43 = 18.43

Use place value and number facts:

- In mental multiplication. (E.g. 40,000 x 6 = 24,000 and 0.03 x 6 = 0.18
- In division to divide one and two place decimals by numbers up to and including 10 using place value. (E.g. 2.4 ÷ 6 = 0.4 or 0.65 ÷ 5 = 0.13, £6.33 ÷ 3 = £2.11)
- Multiply one and two-place decimals by numbers up to and including 10 using place value and partitioning. (E.g. 3.6 x 4 is 12 + 2.4 or 2.53 x 3 is 6 + 1.5 + 0.09)
- Use rounding in mental multiplication. (34 x 19 as (20 x 34) – 34)

Know and use equivalence between simple fractions, decimals and percentages, including in different contexts.

Recognise a given ratio and reduce a given ratio to its lowest terms.

Choose the most efficient method in any given situation

Use rounding and approximation to estimate and check answers

	Solve problems involving addition, subtraction, multiplication and division. Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Multiply simple pairs of proper fractions, writing the answer in its simplest form Divide proper fractions by whole numbers. Multiply one-digit numbers with up to 2 decimal places by whole numbers. Use written division methods in cases where the answer has up to 2 decimal places.	Use grid multiplication to multiply 1- and 2-digit numbers by a number with up to 4 digits Use grid multiplication/vertical written algorithm (ladder) to multiply 1- and 2-digit numbers by a number with one or two decimal places, including amounts of money, E.g. £23.67 x 5 **x** | **20** | **3** | **0.60** | **0.07** | **5** | 100 | 15 | 1.80 | 0.35 | 117.15 Example of vertical (ladder) - *This can be taken to long multiplication for pupils who are confident and accurate.* 3472 X 16 30000 4000 700 20 18000 2400 420 12 34720 20832 55552 Multiply fractions and mixed numbers by whole numbers. Multiply fractions by proper fractions. Use percentages for comparison and calculate simple percentages. **NB: grid method is default method for all children**	Use efficient chunking or short division (bus stop) to divide a number with up to 4 digits by a 1-digit or a (easy) 2-digit number: 1 2 6 4 6 | $7^{1}5^{3}8^{2}4$ Use efficient chunking to divide 3-digit and 4-digit numbers by 2-digit numbers. Give remainders as whole numbers or as fractions or as decimals **Written methods:** Efficient chunking, e.g. 3786 ÷ 36 = **3600** (x100) 3786 ÷ 36 = 105 $^{6}/_{36}$ **= 105 $^{1}/_{6}$** **7200** -3600 = 36 x **100** **10800** 186 **14400** -180 = 36 x **5** **18000** 6 Example of long division – *only for pupils who are confident and accurate.* 200+50+1 15 | 3765 — 15 3000 — 30 765 — 45 750 — 60 15 — 75 90 Divide a one-place or a two-place decimal number by a number ≤ 12 using multiples of the divisors. Divide proper fractions by whole numbers, e.g. **¼ ÷ 3 = $^{1}/_{12}$** **NB: Efficient chunking method is default method for all children**	Concrete apparatus: counting equipment, numicon, multilink, etc. Fingers Bead string/bead bar/beaded line number line 100 grid Bar model Arrays Fraction wall Fraction strips	Counting on and back in multiples Clever counting (all tables) Doubling Halving Set/lots of/array Division 'undoes' multiplication 'Inverse operations' Factors fit into numbers Counting in fractions Prime numbers Prime factors Composite (non-prime) numbers