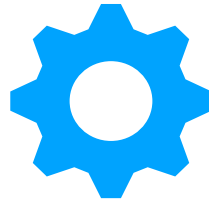
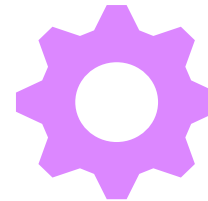


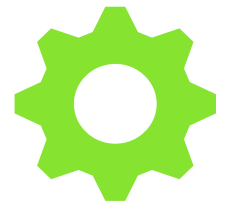
Year 1 - 6



Calculation Policy



Multiplication and Division



Year 1

Multiplication

Division

Maths Talk

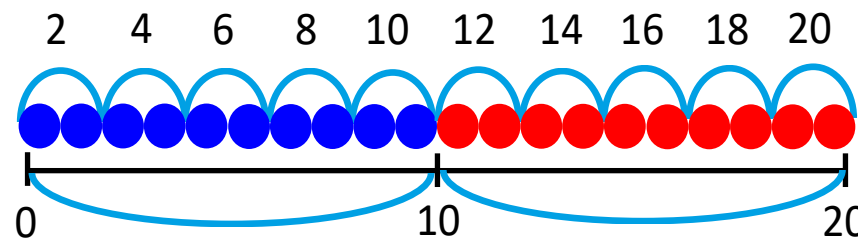
National Curriculum

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.

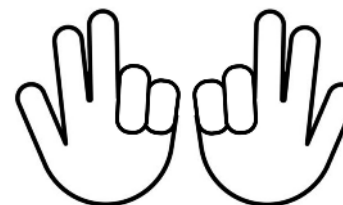
Begin to count in 2s and 10s 'clever counting'



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.

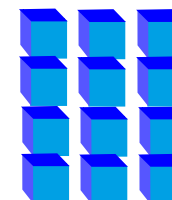
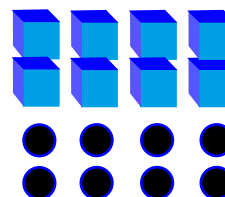
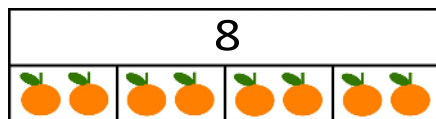
When presenting an image ensure it matches the model.

e.g. $3 \times 2 = 6$



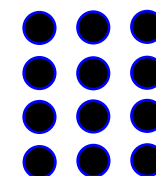
3 represents how many in each group and 2 represents how many groups.

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)



Clever counting
(2s, 5s 10s)
Doubling
Halving
Arrays

Year 2

Multiplication

Division

Maths Talk

National Curriculum

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 ($\times$), division ($\div$) and equals ($=$) signs.

Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

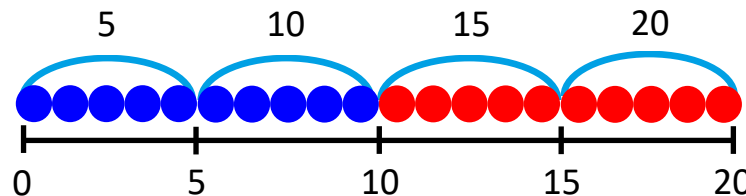
Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ 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'.

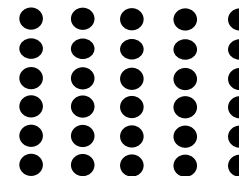


Begin to understand that multiplication is repeated addition and to use arrays
(e.g. 3×4 is three rows of 4 dots)

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?

$$\square \times 5 = 20 \text{ and } 20 \div 5 = \square$$



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.*

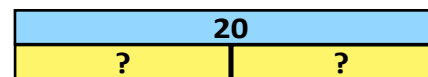
Double numbers up to 20. Begin to double multiples of 5 to 100

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 $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{3}{4}$ 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. $\frac{1}{4}$ of 16 cubes share them out into 4 piles)

Clever counting
(2s, 5s, 10s, 3s)
Doubling
Halving
Set/lots of/array
Division 'undoes'
Multiplication
'Inverse operations'

Year 3

Multiplication

Division

Maths Talk

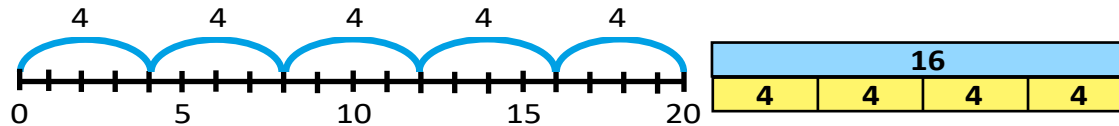
National Curriculum

Recall and use multiplication and division facts for the 3, 4 and 8 (Y2: 2s, 5s & 10s) 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 methods and progressing to formal written methods; solving 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 $743 \div 10 = 74$ etc.)

1000s	100s	10s	1s
	7	4	0
		7	4

Recognise that multiplication is commutative. (e.g. $3 \times 8 = 8 \times 3$)

Recognise that division is not commutative. (e.g. $15 \div 5 \neq 5 \div 15$)

Use place value and number facts in mental multiplication and division.

(e.g. 30×5 is 15×10 & $84 \div 4$ is half of 42)

Double numbers up to 50.

Halve even numbers to 100, halve odd numbers to 20.

28
?
?

Find unit fractions of quantities and begin to find non-unit fractions of quantities.

Partition teen numbers & 2-digit numbers to multiply by a single-digit number.

e.g. $3 \times 14 =$

$3 \times 10 = 30$

$3 \times 4 = 12$

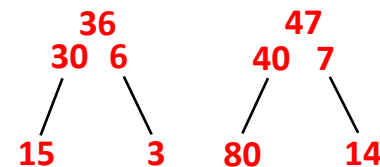
add to find $3 \times 14 = 42$

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. $38 \div 5 = 7 \text{ r}3$

(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. $57 \div 3 =$

We know $10 \times 3 = 30$

$57 - 30 = 27$

We know $9 \times 3 = 27$

So $57 \div 3 = 19$

Clever counting
(2s, 5s 10s, 3s halves, quarters)
Doubling
Halving
Set/lots of/array
Division
'undoes'
Multiplication
'Inverse operations'

Year 4

Multiplication

Division

Maths Talk

National Curriculum

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 $12 \times 12/144 \div 12$.

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. $5632 \div 10 = 563.2$, etc.

1000s	100s	10s	1s	0.1s ($\frac{1}{10}$)
5	6 5	3 6	2 3	2

Multiply multiples of 10, 100, 1000 by single digit numbers. (e.g. 300×6 or 4000×8 by knowing $4 \times 8 = 32$ then multiplying by 1000.

Divide multiples of 100 by 1-digit numbers using division facts. (e.g. $3200 \div 8 = 400$)

Use understanding of place value and number facts in mental multiplication.

(e.g. 36×5 is half of 36×10 and $50 \times 60 = 3000$)

Use place value and number facts in mental division.

(e.g. $245 \div 20$ is double $245 \div 10$)

Find doubles to double 100 and beyond using partitioning.

Find halves of even numbers to 200 and beyond using partitioning.

344	
172	172

Begin to double amounts of money. (e.g. $\pounds 35.60$ doubled = $\pounds 71.20$.)

Begin to halve amounts of money. (e.g. half of $\pounds 52.40 = \pounds 26.20$)

Begin to reduce fractions to their simplest forms. e.g. $\frac{12}{15} = \frac{4}{5}$

Find unit and non-unit fractions of larger amounts.

Partition 2-digit numbers to multiply by a single-digit number mentally. (e.g. 4×24 as 4×20 and 4×4) Multiply near multiples using rounding. (e.g. 33×19 as $33 \times 20 - 33$)

Written method: Multiply a 2-digit number by a 2-digit number using grid method.

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. $156 \div 6$ is $20 + 6$ as $20 \times 6 = 120$ and $6 \times 6 = 36$)

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.

$$86 \div 3 = 28 \text{ r } 2$$

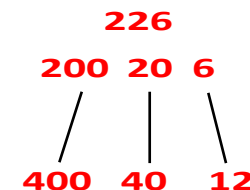
$$\square \times 3 = 86$$

$$20 \times 3 = \underline{60}$$

$$26$$

$$8 \times 3 = \underline{24}$$

$$2$$



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

Year 5

Multiplication

Division

Maths Talk

National Curriculum

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 $12 \times 12/144 \div 12$.

Use knowledge of factors and multiples in multiplication.

(e.g. 43×6 is double 43×3 , and 28×50 is $\frac{1}{2}$ of $28 \times 100 = 1400$)

Use knowledge of multiples and factors, also tests for divisibility in mental division.

(e.g. $246 \div 6$ is $123 \div 3$ 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. $4.302 \times 1000 =$

100,000s	10,000s	1000s	100s	10s	1s	0.1s ($\frac{1}{10}$ s)	0.01s ($\frac{1}{100}$ s)	0.001s ($\frac{1}{1000}$ s)
		4	3	0	4 2	3	0	2

Use knowledge of place value and rounding in mental multiplication.

(e.g. 67×199 as $67 \times 200 - 67$)

Use doubling and halving as a strategy in mental multiplication and division

(e.g. $34 \div 5$ is $(34 \div 10) \times 2$) (e.g. $58 \times 5 = \text{half of } 58 \times 10$, and 34×4 is 34 doubled twice, etc.)

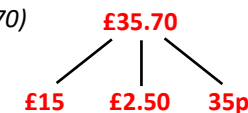
Double amounts of money by partitioning.

(e.g. $\text{£}37.45$ doubled = $\text{£}37$ doubled ($\text{£}74$) plus 45p doubled (90p) $\text{£}74.90$)

16.7	
8.35	8.35

Halve amounts of money by partitioning.

(e.g. half of $\text{£}75.40 = \text{half of } \text{£}75$ (37.50) plus half of 40p (20p) which is $\text{£}37.70$)



Partition 2-digit numbers, including decimals, to multiply by a single-digit number mentally.

(e.g. 6×27 as 6×20 (120) plus 6×7 (42) making 162 or 6.3×7 as 6×7 plus 0.3×7)

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.

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

Continued on next page

Year 5

Multiplication

National Curriculum

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. $936 \times 27 =$

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

$$\begin{array}{r} 253 \times 6 = \\ 253 \\ \times 6 \\ \hline 1200 \\ 300 \\ \hline 18 \\ \hline 1518 \end{array}$$

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. $4 \times \frac{2}{3} = \frac{8}{3} = \frac{22}{3}$.

NB: grid method is default method for all children

Division

Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate.
(e.g. $96 \div 6$ is $10 + 6$, as $10 \times 6 = 60$ and $6 \times 6 = 36$; $312 \div 3$ is $100 + 4$ as $100 \times 3 = 300$ and $4 \times 3 = 12$)

Written methods:

Efficient chunking, e.g. $465 \div 6 =$
 $60 \times 10 = 600$ $465 \div 6 = 77 \frac{3}{6} = 77 \frac{1}{2}$
 120 $-420 = 6 \times 70$
 180 45
 240 $42 = 6 \times 7$
 300 3
 360
 420

Short division (bus stop) to divide a number with up to 4 digits by a number ≤ 12 .

$$\begin{array}{r} 1264 \\ 6 \overline{) 753824} \end{array}$$

Give remainders as whole numbers or as fractions.

NB: Efficient chunking method is default method for all children

Maths Talk

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

Year 6

Multiplication

Division

Maths Talk

National Curriculum

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 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 $12 \times 12/144 \div 12$.

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. $47,310 \div 1000$*

100,000s	10,000s	1000s	100s	10s	1s	0.1s ($\frac{1}{10}$ s)	0.01s ($\frac{1}{100}$ s)	0.001s ($\frac{1}{1000}$ s)
	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. 326×6 is 652×3 which is 1956) and division. (e.g. $438 \div 6$ is $219 \div 3$ 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. 28×25 is $\frac{1}{4}$ of $28 \times 100 = 700$)
- As mental division strategies, *e.g. to divide by 2, 4, 8, 5, 20 and 25.*
(e.g. $628 \div 8$ 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)

$$\begin{array}{r} 36.73 \\ \swarrow \quad \searrow \\ 72 + 1.46 = 73.46 \end{array}$$

$$\begin{array}{r} 36.86 \\ \swarrow \quad \searrow \\ 18 + 0.43 = 18.43 \end{array}$$

Use place value and number facts:

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

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.

Counting on and back in multiples
Clever counting (*all tables*)
Doubling
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Set/lots of/array
Division 'undoes'
Multiplication
'Inverse operations'
Factors fit into numbers
Counting in fractions
Prime numbers
Prime factors
Composite (non-prime) numbers

Continued on next page

Year 6

Multiplication

National Curriculum

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	17.15

Example of vertical (ladder) - *This can be taken to long multiplication for pupils who are confident and accurate.*

$$\begin{array}{r}
 3472 \\
 \times 16 \\
 \hline
 20832 \\
 34720 \\
 \hline
 55552
 \end{array}$$

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

Division

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:

$$\begin{array}{r}
 1264 \\
 6 \overline{) 753824}
 \end{array}$$

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. $3786 \div 36 =$

$$\begin{array}{ll}
 3600 \text{ (x100)} & 3786 \div 36 = 105 \frac{6}{36} = 105 \frac{1}{6} \\
 7200 & -3600 = 36 \times 100 \\
 10800 & 186 \\
 14400 & -180 = 36 \times 5 \\
 18000 & 6
 \end{array}$$

Example of long division – only for pupils who are confident and accurate.

$$\begin{array}{r}
 200+50+1 \\
 15 \overline{) 3765} \\
 \underline{3000} \\
 765 \\
 \underline{750} \\
 15
 \end{array}
 \begin{array}{l}
 15 \\
 30 \\
 45 \\
 60 \\
 75 \\
 90
 \end{array}$$

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. $\frac{3}{4} \div 3 = \frac{1}{4}$

NB: Efficient chunking method is default method for all children

Maths Talk

Counting on and back in multiples
Clever counting (*all tables*)
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