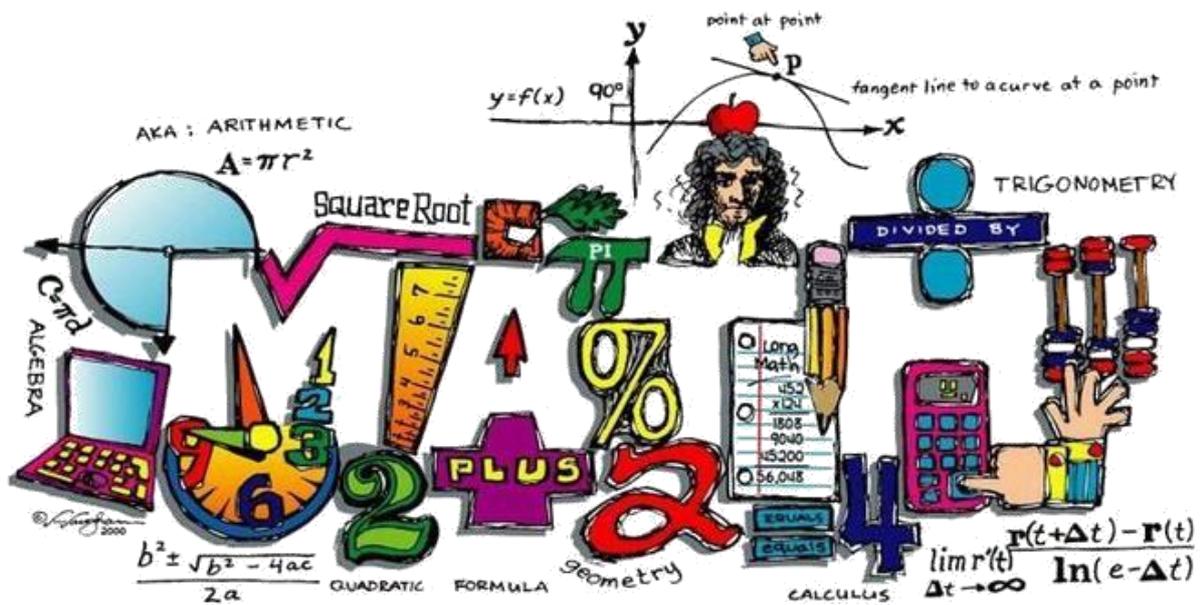


W·A·L·L·I·S·D·E·A·N

JUNIOR · SCHOOL

and Resourced Provision for Hearing Impaired Children

CALCULATION



POLICY

CALCULATION POLICY

This calculation policy has been devised in accordance with the National Curriculum 2014 for the teaching and learning of mathematics.

The aim of this policy is to:

- ensure that all children can use written and mental calculation strategies to include informal jottings of the four operations in a range of routine and non-routine contexts with increasing complexity.
- ensure consistency across the school in the teaching and learning of written calculations using the four operations and that links are made between the four operations.
- ensure there is a clear progression in the children's understanding of the development of written calculations from year 3 to year 6
- promote conceptual understanding building on models and images.
- provide guidance on the teaching of calculation skills for staff and parents.

This policy is organised according to age expectations as set out in the National Curriculum. However, children will only be moved on to the next stage/method when they are secure enough to move on.

Generic:

Children should use mental methods when appropriate, but for calculations that they cannot do in their heads they should use an efficient written method accurately and with confidence.

They should be encouraged to identify the most effective method and make informed choices.

They should make links between practical, visual, mental and written recording.

They should be encouraged to use equipment and models and images, to support their learning e.g. dienes, number lines, hundred squares, numicon, arrow cards and digit cards.

Addition – Year 3

Overview for addition: Pupils should be taught to:

- add numbers mentally, including:
- a three-digit number and ones (176+8)
- a three-digit number and tens (259 + 40)
- a three-digit number and hundreds (281 + 400)
- add numbers with up to three digits, using formal written methods of columnar addition
- 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.

Key Vocabulary:

Add, addition, more, plus, make, altogether, total, equal, double, most, count on, number line, hundreds, tens, ones, digit, partition, recombine, column, tens boundary, hundreds boundary, increase.

Number and place value skills needed for addition:

- read and write numbers up to 1000 in numerals and words
- recognise the place value of each digit in a three digit number (hundreds, tens, ones)
- compare and order numbers up to 1000
- count from 0 in multiples of 4, 8, 50 and 100: find 10 or 100 more or less than a given number
- solve number problems and practical problems involving these ideas.

Adding numbers with up to three digits:

Progression:

TO + TO

HTO + TO - within tens boundary (134 + 25)

HTO + TO - crossing tens boundary (235 + 48)

HTO+ TO - crossing hundreds boundary (483 + 35)

HTO + TO - crossing tens and hundreds boundary (488 + 47)

HTO + HTO - crossing tens boundary (368 + 123)

HTO + HTO - crossing tens and hundreds boundary (576 + 477)

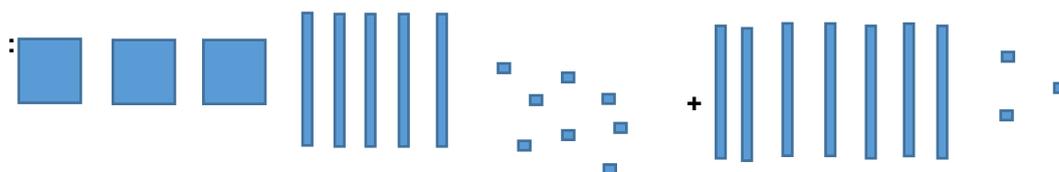
Written method examples:

Either partition both numbers and recombine: $358 + 73 = 300 + 50 + 8 + 70 + 3 = 420 + 11 = 431$

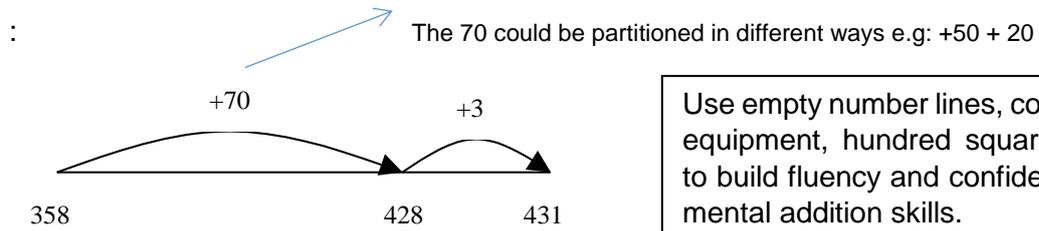
or **partition the second number only :**

$$\begin{aligned} 358 + 73 &= 358 + 70 + 3 \\ &= 428 + 3 \quad (\text{This could also be partitioned: } 428 + 2 + 1) \\ &= 431 \end{aligned}$$

Addition using dienes or drawings to represent: $358 + 73$ can support understanding.

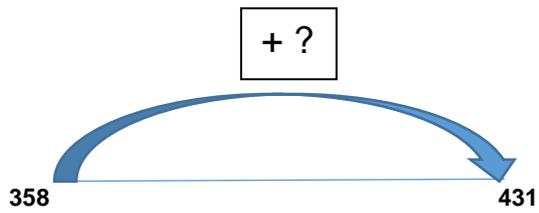


Adding three digit numbers on an empty number line:



Use empty number lines, concrete equipment, hundred squares etc to build fluency and confidence in mental addition skills.

Missing number examples:



A number line can be used for the addition of money in pence or whole pounds.

Plus, use practical methods with coins.

Addition – Year 4

Pupils should be taught to:

- add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition two-step problems in contexts, deciding which operations and methods to use and why
- solve simple measure and money problems with decimals to two decimal places.

Key vocabulary:

Add, addition, more, plus, make, altogether, total, equal, double, most, count on, number line, hundreds, tens, ones, digit, partition, recombine, column, tens boundary, hundreds boundary, increase, horizontal expansion, carry, thousands, inverse, negative, decimal, tenths, hundredths.

Number and place value skills needed for addition:

- recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)
- order and compare numbers beyond 1000
- find 1000 more or less than a given number
- round any number to the nearest 10, 100, 1000
- count in multiples of 6,7,9,25 and 1000
- count backwards through zero to include negative numbers
- solve number and practical problems that involve all of the above and with increasingly large positive numbers.

Written Methods:

- Continue using number line as developed in Year 3
- Children will need lots of experience of partitioning in different ways
- Introduce horizontal expansion:

horizontal expansion: $367 + 185$

$$\begin{array}{r} 300 + 60 + 7 \\ 100 + 80 + 5 \\ \hline 400 + 140 + 12 = 552 \end{array}$$

Use this method with numbers with up to 4 digits

By the summer term:

Add numbers with up to 4 digits using the compact column method

Move from the expanded addition method to the compact column method, adding the units first and carrying numbers underneath the calculation. Also include measures and money contexts.

Extend to numbers with at least four digits:

$$3587 + 675 = 4262$$

Ensure correct place value: the actual value is 5 hundreds add 6 hundreds, not 5 add 6

$$\begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ \hline 111 \end{array}$$

Add the ones first

Carry numbers underneath the bottom line

Extend to decimals in the context of money and measurement:

£15.49
£12.38
£27.87
1

16.39m
12.43m
28.82m
1

Addition – Year 5

Pupils should be taught to:

- add whole numbers with more than 4 digits, including using formal written methods (columnar addition)
- add numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving numbers with up to three decimal places.

Key vocabulary:

Add, addition, more, plus, make, altogether, total, equal, double, most, count on, number line, hundreds, tens, ones, digit, partition, recombine, column, tens boundary, hundreds boundary, increase, horizontal expansion, carry, thousands inverse, negative, decimal, tenths, hundredths, thousandths.

Number and place value skills needed for addition:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above.

Written Methods:

Continue with column addition as introduced in Year 4.

Progress to adding numbers with more than 4 digits, including money, measures and decimals with up to three decimal places.

Example with more than 4 digits:

$$\begin{array}{r} 34567 \\ \underline{23462} \\ 58029 \\ \hline 11 \end{array}$$

Carry numbers underneath the bottom line

Extend to numbers with any number of digits and decimals with 1, 2 and/or 3 decimal places.

$$23.4 + 16.2 = \begin{array}{r} 23.4 \\ \underline{16.2} \\ 39.6 \end{array}$$

The decimal point should be aligned in the same way as the other place value columns and must be in the same column as the answer.

$$13.86 + 9.481 = 23.341$$

$$\begin{array}{r} 13.860 \\ + 9.481 \\ \hline 23.341 \\ \hline 111 \end{array}$$

The decimal point should be aligned in the same place
Empty decimal places can be filled with zero (zero as a place holder)
Say 8 tenths and 4 tenths to reinforce place value.

Addition – Year 6

Pupils should be taught to:

- perform mental calculations with mixed operations and large numbers
- solve multi-step problems in contexts, deciding which operations and methods to use and why
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Key vocabulary:

Add, addition, more, plus, make, altogether, total, equal, double, most, count on, number line, hundreds, tens, ones, digit, partition, recombine, column, tens boundary, hundreds boundary, increase, horizontal expansion, carry, thousands, inverse, negative, decimal, tenths, hundredths, thousandths.

Number and place value skills needed for addition:

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Written Methods:

Continue as in year 5 and extend to adding several numbers of increasing complexity (including money and measures).

```
19623
 4237
123567
  789
3458902
3607118
1 2322
```

Adding several numbers with different numbers of decimal places:

```
23 . 360
 9 . 080
59 . 700
92 . 140
21 1
```

Empty decimal places can be filled with zero to show the place value in each column.

Subtraction – Year 3

Overview for addition: Pupils should be taught to:

- subtract numbers **mentally**, including:
 - a three-digit number and ones (176 - 8)
 - a three-digit number and tens (259 - 40)
 - a three-digit number and hundreds (681 - 400)
- **subtract numbers with up to three digits**
- 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.

Key vocabulary:

Take away, less, minus, subtract, subtraction, how many more/less, count back, difference, decrease, digit, hundreds, tens, ones.

Number and place value skills needed for subtraction:

- read and write numbers up to 1000 in numerals and words
- recognise the place value of each digit in a three digit number (hundreds, tens, ones)
- compare and order numbers up to 1000
- count from 0 in multiples of 4, 8, 50 and 100: find 10 or 100 more or less than a given number
- solve number problems and practical problems involving these ideas.

Subtracting numbers with up to three digits:

Progression:

HTU - TO within tens boundary (138 - 25)

HTU - TO crossing tens boundary (265 - 58)

HTU - TO crossing hundreds and tens boundary (265 - 78)

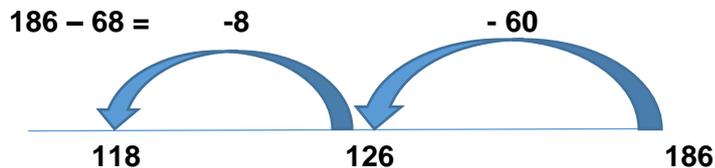
HTU - HTO not crossing tens boundary (365 - 123)

HTU - HTO crossing tens and hundreds boundary (414 - 126)

Written method examples:

Start with 2 digit numbers and progress to three digit numbers:

Subtraction by counting back on a number line: (taught in Year 2)

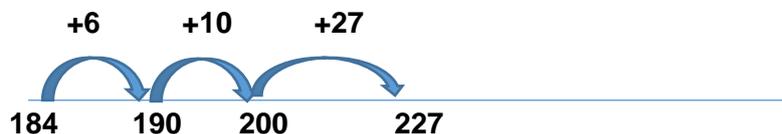


Subtract the tens first and then the ones.

Move towards efficient jumps back.

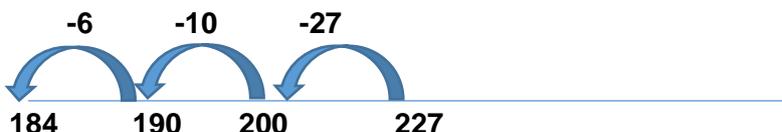
Finding the difference by counting on:

$$227 - 184 = 43$$



Dienes can be used to support subtraction calculations.

Finding the difference by counting back:



Subtraction – Year 4

Pupils should be taught to:

- Subtract numbers with up to 4 digits using the formal written methods of columnar subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve subtraction two-step problems in contexts, deciding which operations and methods to use and why
- solve simple measure and money problems with decimals to two decimal places.

Key vocabulary:

Take away, less, minus, subtract, subtraction, how many more/less, count back, difference, decrease, digit, hundreds, tens, ones, partition, exchange, inverse, column, decomposition.

Number and place value skills needed for subtraction:

- recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)
- order and compare numbers beyond 1000
- find 1000 more or less than a given number
- round any number to the nearest 10, 100, 1000
- count in multiples of 6,7,9,25 and 1000
- count backwards through zero to include negative numbers
- solve number and practical problems that involve all of the above and with increasingly large positive numbers.

Written methods:

Introduce expanded column subtraction:

HTO – TO using expanded partitioned column subtraction (no exchanging required initially)

$$\begin{array}{r} 276 - 43 = \\ \underline{\quad\quad\quad} \\ 200 + 70 + 6 \\ - \quad\quad 40 + 3 \\ \hline 200 + 30 + 3 = 233 \end{array}$$

Using exchanging: TO - TO

72 - 47


$$\begin{array}{r} 60 \\ \cancel{70} + 2 \\ - 40 + 7 \\ \hline 20 + 5 = \underline{25} \end{array}$$

Use Base 10 equipment to explore exchanging and partitioning numbers in different ways.

Before subtracting 7 from the 72 blocks, they will need to exchange a row of 10 for 10 units. Then subtract 7 and subtract 4 tens

Using exchanging: HTU – HTU

Once children are secure with exchanging, they can use expanded partitioned column subtraction to subtract any 2 and 3 digit numbers:

$$374 - 146 = 60$$

$$\begin{array}{r} 60 \\ 300 + 70 + 4 \\ - 100 + 40 + 6 \\ \hline 200 + 20 + 8 = 228 \end{array}$$

Subtract numbers with up to 4 digits:

Continue with expanded partitioned column subtraction with exchanging (decomposition) but with more complex numbers:

$$\begin{array}{r} 2754 - 1562 = 1192 \\ \hline 2000 + \overset{600}{\cancel{700}} + 50 + 4 \\ - 1000 + 500 + 60 + 2 \\ \hline 1000 + 100 + 90 + 2 \end{array}$$

Summer Term Year 4:

If understanding of the expanded method is secure, children will move on to the formal method of decomposition.

Compact column subtraction:

932 – 457 becomes

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ \cancel{9} \quad \cancel{3} \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$$

Answer: 475

To introduce the compact method, ask children to perform a subtraction calculation with the expanded partitioned column subtraction and then display the compact versions for the calculation they have done. Ask them to consider how it relates to the method they know.

Extend to decimals in the context of money and measurement (up to two decimal places)

$$\begin{array}{r} £ 6.45 \\ - £ 4.17 \\ \hline £ 2.28 \end{array}$$

Subtraction – Year 5

Pupils should be taught to:

- subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving numbers with up to three decimal places.

Key vocabulary:

Take away, less, minus, subtract, subtraction, how many more/less, count back, difference, decrease, digit, hundreds, tens, ones, thousands, partition, exchange, inverse, column, decomposition, decimal, tenths, hundredths, thousandths.

Number and place value skills needed for addition:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above.

Written methods:

Use compact column subtraction to subtract numbers with more than 4 digits, including money, measures and decimals with up to three decimal places.

Compact column subtraction with exchanging:

$$\begin{array}{r} \\ 31056 \\ - \quad 2128 \\ \hline 28928 \end{array}$$

Extend to numbers with any number of digits and decimals with 1, 2 and 3 decimal places.

$$13.86 - 9.481 = 4.379$$

$$\begin{array}{r} \\ 13.860 \\ + \quad 9.481 \\ \hline 4.379 \end{array}$$

The decimal point should be aligned in the same place

Empty decimal places can be filled with zero (zero as a place holder)

Subtraction – Year 6

Pupils should be taught to:

- perform mental calculations with mixed operations and large numbers.
- solve multi-step problems in contexts, deciding which operations and methods to use and why
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Key vocabulary:

Take away, less, minus, subtract, subtraction, how many more/less, count back, difference, decrease, digit, hundreds, tens, ones, thousands, partition, exchange, inverse, column, decomposition, compact, decimal, tenths, hundredths, thousandths.

Number and place value skills needed for addition:

- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Written methods:

As year 5, using compact column subtraction with exchanging and progress to larger numbers and mixed decimal numbers, aiming for both conceptual understanding and procedural fluency.

$$\begin{array}{r} \begin{array}{ccccccc} 0 & 9 & 1 & & 3 & 1 & \\ 1 & 0 & 5 & . & 4 & 1 & 9 \text{ kg} \\ 3 & 6 & . & 0 & 8 & 0 & \text{kg} \\ \hline 6 & 9 & . & 3 & 3 & 9 & \text{kg} \end{array} \end{array}$$

The decimal point should be aligned in the same place

Empty decimal places can be filled with zero (zero as a place holder)

Use the compact column method to subtract money and measures.

Multiplication – Year 3

Overview for multiplication:

Pupils should be taught to:

- recall and use multiplication facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication 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 integer scaling problems and correspondence problems in which n objects are connected to m objects.

Key Vocabulary:

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, column, row, commutative, times.

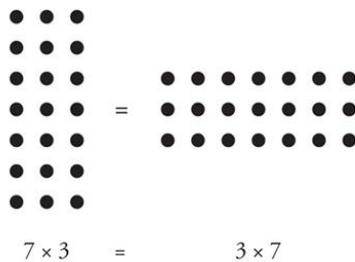
Key skills needed for multiplication:

- Partition numbers into hundreds, tens and ones
- Multiply multiples of 10 by a single digit (30×4)
- Recall multiplication facts for the 2,3,4,5,8 and 10 times tables
- Know that multiplication is commutative (3×4 is the same as 4×3)
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

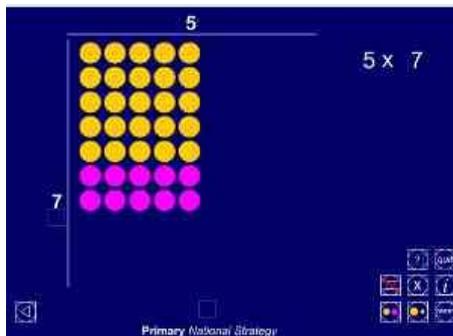
Written methods:

Multiply two digit numbers by a single digit: (2,3,4 5,,8,10) Introduce digits at different times.

Use arrays : Example: $7 \times 3 = 21$

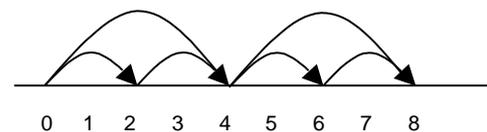


Use within a grid:

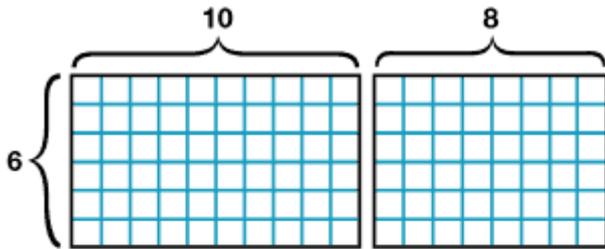


A number-line can also be used to solve multiplication facts:

4×2 or 2×4 :



Use arrays to multiply numbers up to 20 by a single digit:



$$18 \times 6 = 60 + 48 = 108$$

Progress to any 2 digit number by a single digit number using the grid method:

X	30	5	
2	60	10	=70

Multiplication – Year 4

Pupils should be taught to:

- recall multiplication 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 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
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Key vocabulary:

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, column, row, commutative, times, grid, multiple, product.

Key skills needed for multiplication:

- Recall all times-tables up to 12×12
- Recognise place value of digits in up to 4 digit numbers
- count in multiples of 6, 7, 9, 25 and 1000
- recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)

Written Methods:

Recap grid method from Year 3 – two digit numbers by a one digit number:

$$\begin{array}{r|l|l} X & 30 & 5 \\ \hline 2 & 60 & 10 \end{array} = 70$$

Extend to three digit numbers by a one digit number:

$$136 \times 5 =$$

x	100	30	6
5	500	150	30

$$500 + 150 + 30 = 680$$

Multiplication – Year 5

Pupils should be taught to:

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two 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 numbers mentally drawing upon known facts
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- Solve problems involving multiplication and division and a combination of these, including understanding the meaning of the equals sign
- 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.

Key vocabulary:

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, column, row, commutative, times, grid, multiple, product, inverse, square, cubed, factor, integer, decimal, short/long multiplication, carry, prime number.

Key skills needed for multiplication;

- know all multiplication tables up to 12 x 12
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.

Written Methods:

Multiply numbers up to 4 digits by a one or two digit number. (Long multiplication for two digit numbers).

Begin with grid method using THTO x one digit:

$$3425 \times 6 = 20550$$

x	3000	400	20	5
6	18000	2400	120	30

Introduce short multiplication:

24 × 6 becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$$

Answer: 144

342 × 7 becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 21 \end{array}$$

Answer: 2394

2741 × 6 becomes

$$\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ \hline 42 \end{array}$$

Answer: 16 446

Progress to long multiplication for two digit numbers:

$$\begin{array}{r} 2 \\ 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

Answer: 384

Multiplication – Year 6

Pupils should be taught to:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- identify common factors, common multiples and prime numbers
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Key vocabulary:

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, column, row, commutative, times, grid, multiple, product, inverse, square, cubed, factor, integer, decimal, short/long multiplication, carry, prime number.

Key skills needed for multiplication:

- recall multiplication facts for all times-tables up to 12 x12 (as year 5 and year 5)
- read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- perform mental calculations with mixed operations and large numbers
- Round any integer to a required degree of accuracy.

Written Methods:

Recap two digit numbers x two digit numbers using long multiplication (year 5)

$$\begin{array}{r} 2 \\ 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

Answer: 384

Progress to HTO x TO and THTO x TO:

124 x 26 becomes

$$\begin{array}{r} 1 \quad 2 \\ 124 \\ \times \quad 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline 1 \quad 1 \end{array}$$

Answer: 3224

Division – Year 3

Overview for division:

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers by one digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.

Key Vocabulary:

Share, share equally, group, equal groups, divide, arrays, divided by, divided into.

Number and place value skills needed for division:

- Partition numbers into hundreds, tens and ones
- Recall multiplication facts for the 2,3,4,5,8 and 10 times tables.
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

Written methods:

Divide 2 digit numbers by a single digit number (link to x tables).

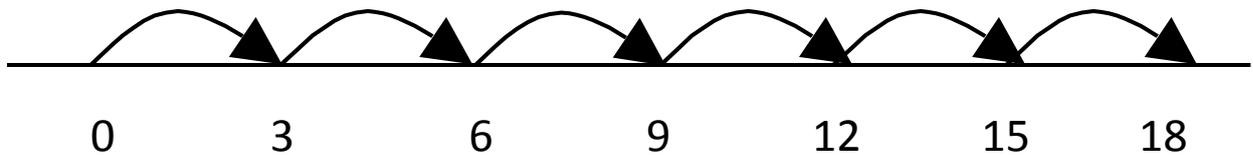
Understand division as sharing and grouping:

$18 \div 3$ can be modelled as:

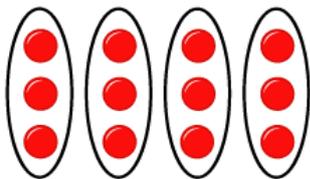
Sharing : 18 shared between 3

OR

Grouping - How many 3's make 18?



Arrays can also be used for division:

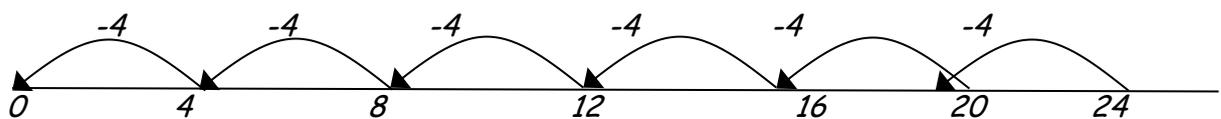


$$12 \div 3 = 4$$

Repeated subtraction using a number line

Children will use an empty number line to support their calculation.

$$24 \div 4 = 6$$



Division – Year 4

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12×12
- use place value, known and derived facts to divide mentally, including: dividing by 1, 10 and 100
- 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 and hundredths.

Key vocabulary:

Share, share equally, group, equal groups, divide, arrays, divided by, divided into, grouping, remainder, divisible by, factor.

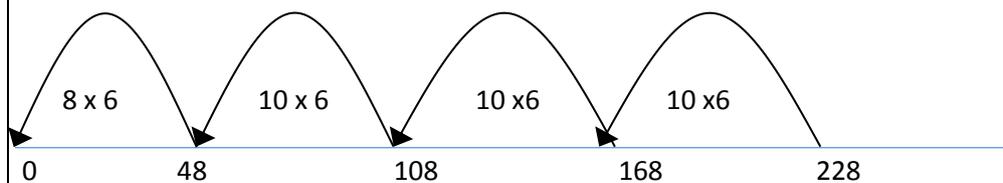
Number and place value skills needed for division:

- Recall all multiplication facts up to 12×12 .

Written Methods:

Divide TU by ones by subtracting multiples of the divisor on a number line:

$$228 \div 6 = 38$$



Progress to:

$$\begin{array}{r} 6 \overline{)196} \\ - \underline{60} \quad 6 \times 10 \\ 136 \\ - \underline{60} \quad 6 \times 10 \\ 76 \\ - \underline{60} \quad 6 \times 10 \\ 16 \\ - \underline{12} \quad 6 \times 2 \\ 4 \quad 32 \\ \text{Answer: } \quad 32 \text{ R } 4 \end{array}$$

Division – Year 5

Pupils should be taught to:

- 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
- divide whole numbers and those involving decimals by 10, 100 and 1000
- Solve problems involving division and a combination of these, including understanding the meaning of the equals sign
- 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.

Key vocabulary:

Share, share equally, group, equal groups, divide, arrays, divided by, divided into, short division, multiple, inverse, quotient.

Number and place value skills needed for division:

- Know all multiplication facts up to 12 x 12.

Written Methods:

Divide 4 digit numbers by a one digit number

Recap division methods from the end of year 4:

$$\begin{array}{r} 6 \overline{)196} \\ - \underline{60} \quad 6 \times 10 \\ 136 \\ - \underline{60} \quad 6 \times 10 \\ 76 \\ - \underline{60} \quad 6 \times 10 \\ 16 \\ - \underline{12} \quad 6 \times 2 \\ 4 \quad 32 \\ \text{Answer: } \quad 32 \text{ R } 4 \end{array}$$

Introduce short division method:

98 ÷ 7 becomes

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

Answer: 14

432 ÷ 5 becomes

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

Answer: 86 remainder 2

Use chunking for two digit numbers:

$$\begin{array}{r} 24 \overline{) 560} \\ 20 - \underline{480} \quad 24 \times 20 \\ 80 \\ 3 \quad \underline{72} \quad 24 \times 3 \\ 8 \end{array}$$

Answer: 23 R 8

Division – Year 6**Pupils should be taught to:**

- 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
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Key vocabulary:

Share, share equally, group, equal groups, divide, arrays, divided by, divided into, short division, multiple, inverse, quotient.

Number and place value skills needed for addition:

- Know all multiplication facts up to 12 x 12.

Written Methods:

Divide numbers up to 4 digits by a two digit whole number

Use long division:**Examples:**

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

