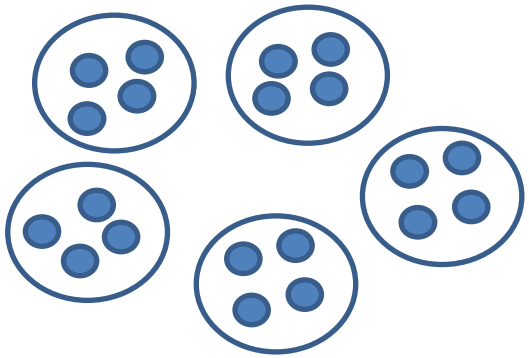
KEY STAGE 1

Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, children will develop an understanding of how numbers work, so that they are confident with 2-digit numbers and beginning to read and say numbers above 100.

Addition and Subtraction: A focus on number bonds, first via practical hands-on experiences and subsequently using memorisation techniques, enables a good grounding in these crucial facts, and ensures that all children leave Year 2 knowing the pairs of numbers which make all the numbers up to 10 at least. Children will also have experienced and been taught pairs to 20. Children's knowledge of number facts enables them to add several 1-digit numbers, and to add/subtract a 1-digit number to/from a 2-digit number. Another important conceptual tool is the ability to add/subtract 1 or 10, and to understand which digit changes and why. This understanding is extended to enable children to add and subtract multiples of 10 to and from any 2-digit number. The most important application of this knowledge is the ability to add or subtract any pair of 2-digit numbers by counting on or back in 10s and 1s. Children may extend this to adding by partitioning numbers into 10s and 1s.	**Multiplication and Division:** Children will be taught to count in 2s, 3s, 5s and 10s, and will relate this skill to repeated addition. Children will meet and begin to learn the associated ×2, ×3, ×5 and ×10 tables. Engaging in a practical way with the concept of repeated addition and the use of arrays enables children to develop a preliminary understanding of multiplication, and asking them to consider how many groups of a given number make a total will introduce them to the idea of division. Children will also be taught to double and halve numbers, and will thus experience scaling up or down as a further aspect of multiplication and division.	**Fractions:** Fractions will be introduced as numbers and as operators, specifically in relation to halves, quarters and thirds.

Year 1

	Mental calculation	Written calculation	Support to Achieve
Y1 + –	Number bonds ('story' of 5, 6, 7, 8, 9 and 10), taught through games such as 'Ping Pong' or 'Cross the River'. These are also displayed in the classroom Count on or back in 1s from a given 2-digit number Add or subtract two 1-digit numbers Add three 1-digit numbers, spotting doubles or pairs to 10 Count on or back in 10s from any given 2-digit number Use number facts to add or subtract 1-digit numbers to or from 2-digit numbers e.g. *Use 4 + 3 to work out 24 + 3, 37 - 3* Add by putting the larger number first	Children are taught to record their number sentences using the correct symbols. These symbols are referred to by (all of) their mathematical names. The children are presented with number sentences in different orders and with missing numbers etc, to ensure understanding. Written symbols have an accompanying physical action and sound, generated by each class.	Children may still need, and will always have access to, physical objects to help them solve problems and act out number stories. ICT is used to provide interactive games to reinforce learning, and make links with home (eg through 'Activelearn'). Video clips are also used to reinforce key concepts or number stories (eg 'BBC Clips'). Songs and number rhymes are also taught, building on work from EYFS. Related vocabulary is taught explicitly and displayed prominently. Hundred Squares, number-lines and numicon are used in adult-focus activities so that their use can be modelled, and are made available to

Y1 **×** **÷**	Begin to count in 2s, 5s and 10s Begin to say what three 5s are by counting in 5s, or what four 2s are by counting in 2s, etc. Double numbers to 10 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 multiply or find how many sets of a small number make a larger number, eg:  Children may start to record this as a number sentence using symbols, in the same ways as for addition and subtraction, if ready.	groups in their independent or unaided activities. Diennes and other apparatus (such as bunched-up straws) are introduced to reinforce Place Value and build upon numicon work. Opportunities to independently use, apply or practise their numbers skills are planned and provided for. 100 Square displayed prominently in classroom. Kinaesthetic strategies are used such as using a whole group's hands to count in 5s etc.

Mastery of Y1 Learning			
Fluency	**Problem Solving**	**Communication**	**Reasoning**

Children are given opportunities, both in structured activities and in self-initiated learning, to use their calculation skills in real-life contexts to solve problems and through games.

They are encouraged to explain how they worked out a problem and how they know their answer is correct, through higher-order questioning and use of talk partners.

They are also challenged to spot patterns, for example by colouring multiples of 5 on a hundred square.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

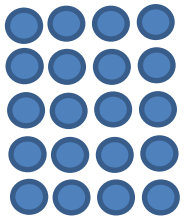
Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Day to day opportunities are found to highlight real-life application Maths eg 'We have 3 children off today, how many children should I have in front of me then?'

Year 2

	Mental calculation	Written calculation	Support to Achieve
Y2 ***+*** ***–***	Number bonds – know all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20, predominantly taught through games such as Ping-Pong' Count on and back in 1s and 10s from any given 2-digit number Add two or three 1-digit numbers Add or subtract 1-digit number to/from any 2-digit number using number facts, including bridging multiples of 10 e.g. *45 + 4* e.g. *32 - 7* Add or subtract10 and small multiples of 10 to/from any given 2-digit number Add or subtract any pair of 2-digit numbers, by	Children are taught to record their number sentences using the correct symbols. These symbols are referred to by (all of) their mathematical names. The children are presented with number sentences in different orders and with missing numbers etc, to ensure understanding. Pictures are also used as a support and to represent quantities, particularly when recording investigative work.	Diennes and Place Value Cards are used predominantly to reinforce the importance of place value to calculation, and as tactile aids. Money is also used to help children make a 'real' link, particularly using 10p and 1p coins. ICT is used to provide interactive games to reinforce learning, and make links with home (eg through 'Activelearn'). Related vocabulary is taught explicitly and displayed prominently. Hundred squares are always available to the children, as well as Diennes, and the children are now taught to move in 10s and 1s around the hundred square by using the 'spider and fly' (spider moves in 10s, fly moves in 1s). Learning number bonds up to 20 is prioritized, to

	counting on or back in 10s and 1s.		lay the foundations for future learning for all pupils. These are displayed prominently in the classroom. 100 Square displayed prominently in classroom. Kinaesthetic strategies are used such as using a whole group's hands to count in 5s etc. Actions are also used when counting to help with the introduction of times tables – eg clapping on every third number using the rhythm of 'We Will Rock You'. Grid lines and colouring are used to help children think about fractions of shapes and begin to relate this to quantities.
Y2 **×** **÷**	Count in 2s, 5s and 10s Begin to count in 3s Begin to understand that multiplication is repeated addition and to use arrays e.g. *3 × 4 is three rows of 4 dots* Begin to learn the ×2, ×3, ×5 and ×10 tables, seeing these as 'lots of' e.g. *5 lots of 2, 6 lots of 2, 7 lots of 2* 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 2s* Relate division to grouping e.g. *How many groups of 5 in 15?* Double and halve numbers up to 20 Begin to double multiples of 5 to 100 Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5 Begin to halve numbers to 40 and multiples of 10 to 100 Find $^1/_2$, $^1/_3$, $^1/_4$ and $^3/_4$ of a quantity of objects and of amounts (whole number answers)	All children now start to record number sentences using the mathematical symbols Children continue to use arrays, as shown above in the Year 1 section, however they are now encouraged to present these as grids to make related facts clear:  5 lots of 4 4 x 5	

Mastery of Y2 Learning

Fluency	Problem Solving	Communication	Reasoning

Children are given opportunities to use their calculation skills in real-life contexts to solve problems and through games.

Calculations are deliberately presented in different ways, eg with symbols replacing numbers or numbers missing, in order to stretch and challenge as well as ensuring deep understanding.

They are encouraged to explain how they worked out a problem and how they know their answer is correct, through higher-order questioning and use of talk partners.

They are challenged to spot patterns, for example by colouring multiples of 3 on a hundred square.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Finding inverse and related facts are emphasised, eg 5+3=8, therefore 8-3=5 and 50+30=80 etc.

Children are also encouraged to generate their own problems and 'number stories' to match calculations.

Role Play is used, particularly involving money.

Day to day opportunities are found to highlight real-life application Maths eg 'We have 3 children off today, how many children should I have in front of me then?'

LOWER KEY STAGE 2

In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.

Addition and subtraction: Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the 'counting in 1s' or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced.	**Multiplication and division:** This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12 × 12. Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but 'friendly' numbers, e.g. when dividing by 5 or multiplying by 20.	**Fractions and decimals:** Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form, as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, multiplying and dividing whole numbers by 10 and 100.

Year 3

	Mental calculation	Written calculation	Support to Achieve
Y3 + –	Know pairs with each total to 20, predominantly taught through games such as Ping-Pong' e.g. *2 + 6 = 8, 12 - 6 = 6, 7 + 8 = 15* Know pairs of multiples of 10 with a total of 100 Add or subtract two 2-digit numbers by counting on in 10s and 1s or by using partitioning Add and subtract multiples and near multiples of 10 and 100 Perform place-value additions and subtractions without a struggle e.g. *300 + 8 + 50 = 358* e.g. *536 – 30 = 506* Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number e.g. *104 + 56 is 160 since 104 + 50 = 154*	Initially, use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers eg 234+ 567 = 200 30 4 + 500 60 7 700 90 11 = 801 Children are taught to leave this space, as it is used later. In time, the children are taught to 'carry' within this method, to begin to bridge towards 'compact' methods:	Visual representation of 10s and 1s continues to be a priority, building on the work in Year 2. Alternative representations are explored (eg children generating and using their own marks to support calculation). Diennes, hundred squares and Place Value Cards continue to be used for modelling and made available at all times. These tactile resources are used to model how and why the written methods work, particularly when new methods are introduced. Money is also still used to help children make a 'real' link, particularly using 10p and 1p coins. ICT is used to provide interactive games to reinforce learning, and make links with home (eg

	and 6 + 4 = 10 *676 + 8 is 684 since 8 = 4 + 4 and 76 + 4 + 4 = 84* Subtract 2-digit numbers from numbers > 100 by counting up e.g. *143 – 76 is done by starting at 76. Then add 4 (80), then add 20 (100), then add 43, making the difference a total of 67* Subtract, when appropriate, by counting back or taking away, using place value and number facts. Children are taught to explore and think about which calculation strategy will work best with which calculations. Add pairs of 'friendly' 3-digit numbers e.g. *320 + 450* Begin to add amounts of money using partitioning Find change from £1, £5 and £10	234+ 567 = 200 30 4 + 500 60 7 *100 10* 800 0 1 = 801 The children can now begin to use compact column addition to add numbers with 3 digits, however the link with place value is continually emphasised and modelled, eg by showing with diennes how it works, and by not referring to single digits just yet. 234+ 567 = 234 + 567 *11* 801 Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers e.g. *423 – 357* Number lines are modelled and may be used to support this. Begin to add and subtract like fractions e.g. $^3/_8 + ^1/_8 + ^1/_8$ Recognise fractions that add to 1 e.g. $^1/_4 + ^3/_4$ e.g. $^3/_5 + ^2/_5$	through 'Activelearn'). Related vocabulary is taught explicitly and displayed prominently. Learning number bonds up to 20 continues to be prioritized, to secure the foundations for future learning for all pupils. These are displayed prominently in the classroom. Visual and tactile resources are used to represent fractions eg fraction walls and fraction wheels. Links between the times tables are emphasised and modelled, such as repeated doubling for x4 and x8. Multiplication squares are also used to emphasise the patterns and tricks. Objects such as unifix cubes are still used and available, particularly for multiplication and division. Weekly Times Table challenges, again to lay secure foundations for future learning. Games are used to help learn these tables. Kinaesthetic strategies are used such as using a whole group's hands to count in 5s etc. Actions are also used when counting to help with the introduction of times tables – eg clapping on every third number using the rhythm of 'We Will Rock You'. Example 'Number Fact Families' are displayed in the classroom.
Y3 **×** **÷**	Know by heart all the multiplication facts in the ×2, ×3, ×4, ×5, ×8 and ×10 tables, and the related division facts.	Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers eg	

	Multiply and divide whole numbers by 10 and 100, with whole number answers. Recognise that multiplication is commutative (can be done in either order), but division is not Use place value and number facts in mental multiplication and division e.g. *30 × 5 is 15 × 10* e.g. *84 ÷ 4 is half of 42* Partition teen numbers to multiply by a 1-digit number e.g. *3 × 14 as 3 × 10 and 3 × 4* Double numbers up to 50 Halve even numbers to 100, halve odd numbers to 20 Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders e.g. *57 ÷ 3 is 10 + 9 as 10 × 3 = 30 and 9 × 3 = 27*	50 4 so 54x3=162 3 | 150 | 12 Perform divisions up to just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number, eg: 21 - 1x4 = 17 - 2x4 = 13 … - 5x4 = 1 so 21/4 = 5 r 1 Find unit fractions of quantities by dividing and begin to find non-unit fractions of quantities	

Mastery of Y3 Learning

Fluency	Problem Solving	Communication	Reasoning

Children are given opportunities to use their calculation skills in real-life contexts to solve problems and through games.

Calculations are deliberately presented in different ways, eg with symbols replacing numbers or numbers missing, in order to stretch and challenge as well as ensuring deep understanding.

The children are challenged to spot and explain patterns, eg in the multiplication square.

They are encouraged to explain how they worked out a problem and how they know their answer is correct, through higher-order questioning and use of talk partners.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Finding inverse and related facts are emphasised, eg 15+3=18, therefore 18-3=15 and 150+30=180 etc.

Children are also encouraged to generate their own problems and 'number stories' to match calculations.

Role Play is used, particularly involving money.

Day to day opportunities are found to highlight real-life application Maths eg 'Spellings are due in 1 week – which date will that be?'

Children are challenged to use the full range of mathematical ideas and operations they have learned so far, eg by finding the most interesting ways to arrive at a particular number.

Year 4

	Mental calculation	Written calculation	Support to Achieve
Y4 ***+*** ***–***	Add or subtract any two 2-digit numbers by partitioning or counting on Know by heart/quickly derive number bonds to 100 and to £1 Add to the next 100, £1 and whole number e.g. *234 + 66 = 300* e.g. *3·4 + 0·6 = 4* Perform place-value additions or subtractions without a struggle: e.g. *300 + 8 + 50 + 4000 = 4358* e.g. *4736 – 706 = 4030* Add or subtract multiples and near multiples of 10, 100 and 1000 Add £1, 10p, 1p to amounts of money Use place value and number facts to add 1-, 2-, 3- and 4-digit numbers where a mental calculation is appropriate e.g. *4004 + 156 by knowing that 6 + 4 = 10 and that 4004 + 150 = 4154 so the total is*	Column addition is extended for 3-digit and 4-digit numbers e.g. 234 + 1567 + 321 = 234 1567 + 321 *111* 2122 Decimals are also introduced to this method in the form of money: £2.34+ £5.67 = £2 . 34 + £5 . 67 *1 1* £8 . 01	Diennes and Hundred Squares continue to be available, however Place Value counters now become more important and their use is introduced and modelled carefully. These tactile resources are used to model how and why the written methods work, particularly when new methods are introduced. ICT is used to provide interactive games to reinforce learning, and make links with home (eg through 'Activelearn'). Related vocabulary is taught explicitly and displayed prominently. Visual and tactile resources are used to represent fractions eg fraction walls and fraction wheels. Links between the times tables are emphasised and modelled, such as repeated doubling for x4 and x8. Multiplication squares are also used to emphasise the patterns and tricks.

	4160 Add or subtract multiples of 0·1 Subtract by counting up e.g. *503 – 368 is done by adding* *368 + 2 + 30 + 100 + 3 (so we added 135)* Subtract, when appropriate, by counting back or taking away, using place value and number facts Subtract £1, 10p, 1p from amounts of money Find change from £10, £20 and £50	Introduce expanded column subtraction for 3- and 4-digit numbers, eg: *20* 1534 - 517 = 1000 500 ~~30~~ ^{1}4 - 500 10 7 1000 0 10 7 = 1017 This process is referred to as 'exchanging' and is modelled with diennes and/or place value counters. However, use complementary addition as before to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100 e.g. *2002 – 1865* Children will be taught explicitly how to choose/think about the most appropriate calculation strategy. Add and subtract like fractions e.g. $^{3}/_{5} + {}^{4}/_{5} = {}^{7}/_{5} = 1\,{}^{2}/_{5}$ Be confident with fractions that add to 1 and fraction complements to 1 e.g. $^{2}/_{3} + \_ = 1$	Weekly Times Table challenges, again to lay secure foundations for future learning. Games are used to help learn these tables. Kinaesthetic strategies are used , for example 'moving' children to demonstrate the effect of multiplying or dividing by 10 or 100. Place Value grids are also introduced, and their use modelled. Example 'Number Fact Families' are displayed in the classroom.

Y4
×
÷

Know by heart all the multiplication facts up to 12 × 12, and related division facts

Recognise factors up to 12 of 2-digit numbers

Multiply whole numbers and 1-place decimals by 10, 100, 1000, and divide whole numbers by these to give 1 decimal place answers.

Multiply multiples of 10, 100 and 1000 by 1-digit numbers

e.g. *300 × 6*
e.g. *4000 × 8*

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 and division

e.g. *36 × 5 is half of 36 × 10*
e.g. *50 × 60 = 3000*

Partition 2-digit numbers to multiply by a 1-digit number mentally

e.g. *4 × 24 as 4 × 20 and 4 × 4*

Multiply near multiples by rounding

e.g. *33 × 19 as (33 × 20) – 33*

Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate

e.g. *156 ÷ 6 is 20 + 6 as 20 × 6 = 120 and 6 × 6 = 36*

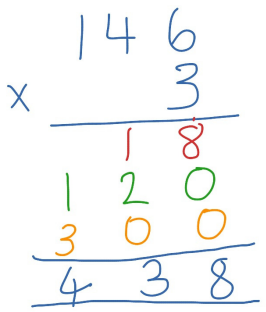
Find doubles to double 100 and beyond using partitioning (and corresponding halves).

Begin to double and halve amounts of money

e.g. *£35·60 doubled is £71·20*

Move from the grid method used in Year 3 to using a vertical written method to multiply a 1-digit number by a 3-digit number (ladder method).

Eg:



The link between the methods, and how they are actually the same thing, should be emphasised and made explicit.

Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method):

	50	4
10	500	40
3	150	12

so 54x13=702

Use a vertical written method (building on Year 3 but subtracting multiples of the divisor) to divide a 2-digit or a 3-digit number by a 1-digit number:

		67 - 10x4 = 27 - 5x4 = 7 - 1x4 = 3 so 67/4 = 26 r 3 Give remainders as whole numbers Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts	

Mastery of Y4 Learning

Fluency	Problem Solving	Communication	Reasoning

Children are given opportunities to use their calculation skills in real-life contexts to solve problems and through games.

Calculations are deliberately presented in different ways, eg with symbols replacing numbers or numbers missing, in order to stretch and challenge as well as ensuring deep understanding.

The children are challenged to spot and explain patterns, eg in the multiplication square.

They are encouraged to explain how they worked out a problem and how they know their answer is correct, through higher-order questioning and use of talk partners, and begin to record these thought processes on paper clearly and understandably.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Day to day opportunities are found to highlight real-life application Maths eg 'Spellings are due in 1 week – which date will that be?'

Children are challenged to use the full range of mathematical ideas and operations they have learned so far, eg by finding the most interesting ways to arrive at a particular number, including within certain constraints, eg 'only using these numbers…'

UPPER KEY STAGE 2

Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions.

Addition and subtraction: Children will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to 2 decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Negative numbers will be added and subtracted.	**Multiplication and division:** Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as *40 000 × 6* or *40 000 ÷ 8*. In addition, it is in Years 5 and 6 that children extend their knowledge and confidence in using written algorithms for multiplication and division.	**Fractions, decimals, percentages and ratio:** Fractions and decimals are also added, subtracted, divided and multiplied, within the bounds of children's understanding of these more complicated numbers. Children will also calculate simple percentages and ratios.

Year 5

	Mental calculation	Written calculation	Support to Achieve
Y5 + –	Know number bonds to 1 and to the next whole number Add to the next 10 from a decimal number e.g. *13·6 + 6·4 = 20* Add or subtract numbers with 2 significant digits only, using mental strategies e.g. *3·4 + 4·8* e.g. *23 000 + 47 000* Add or subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. *8000 + 7000* e.g. *600 000 + 700 000* Add or subtract near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers e.g. *82 472 + 30 004* Add or subtract decimal numbers which are near multiples of 1 or 10, including money e.g. *6·34 + 1·99*	*In Year 5 we continue to use the methods established for addition in Year 4 (see above), extending to 5 digits or more and using more for decimals:* Use column addition to add two or three whole numbers with up to 5 digits Use column addition to add any pair of 2-place decimal numbers, including amounts of money *We begin to move from expanded subtraction, introduced in Year 4, to compact subtraction as happened for addition in Year 3 (see above). However, they should now be able to deal with up to 5 digit numbers, eg:*	Diennes and Hundred Squares continue to be available, however Place Value counters are now the predominant resource that is modelled as a tactile support, and this includes decimal values. These tactile resources are used to model how and why the written methods work, particularly now for multiplication and division. ICT is used to provide interactive games to reinforce learning, and make links with home (eg through 'Activelearn'). Related vocabulary is taught explicitly and displayed prominently. Visual and tactile resources are used to represent fractions eg fraction walls and fraction wheels. Children are taught how tactile resources can be used to represent decimal values, and the similarities to calculating with decimals and with whole numbers are therefore made explicit. Decimal and fraction number lines are displayed

	e.g. *£34·59 + £19·95* Use place value and number facts to add two or more 'friendly' numbers, including money and decimals e.g. *3 + 8 + 6 + 4 + 7* e.g. *0·6 + 0·7 + 0·4* e.g. *2056 + 44* Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction e.g. *£10 – £3·45* e.g. *1000 – 782*	87654 – 12345 = 8 7 6 5 14 - 1 2 3 4 5 7 5 3 0 9 Use compact or expanded column subtraction to subtract numbers with up to 5 digits Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money Begin to add or subtract related fractions using equivalences e.g. $^1/_2 + {}^1/_6 = {}^3/_6 + {}^1/_6$ Choose the most efficient method in any given situation	prominently. Weekly Times Table challenges, again to lay secure foundations for future learning. Games are used to help learn these tables. Kinaesthetic strategies are used , for example 'moving' children to demonstrate the effect of multiplying or dividing by 10 or 100. Place Value grids are available, and their use modelled. Example 'Number Fact Families', matched to the expectations of mental maths for the year group, are displayed in the classroom.
Y5 **×** **÷**	Know by heart all the multiplication facts up to 12 × 12 and related division facts Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000, and do the inverse Use knowledge of factors and multiples in multiplication and division e.g. *43 × 6 is double 43 × 3* e.g. *28 × 50 is $^1/_2$ of 28 × 100 = 1400* e.g. *246 ÷ 6 is 123 ÷ 3* Use doubling and halving as mental division strategies e.g. *34 ÷ 5 is (34 ÷ 10) × 2* Use knowledge of place value and rounding in	Move from the ladder method (see above) to using short multiplication to multiply a 1-digit number by a number with up to 4 digits: Eg 1234 x 5 = 1 2 3 4 X 5 *1 1 2* 6 1 7 0 The link between the methods, and how they are actually the same thing, should be emphasised and made explicit. Also, it is important that what is happening with place value is stressed.	

	mental multiplication and division e.g. *67 × 199 as 67 × 200 – 67* Use doubling and halving as a strategy in mental multiplication e.g. *58 × 5 is half of 58 × 10* e.g. *34 × 4 is 34 doubled twice* Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally e.g. *6 × 27 as 6 × 20 (120) plus 6 × 7 (42)* e.g. *6·3 × 7 as 6 × 7 (42) plus 0·3 × 7 (2·1)* Double and halve amounts of money by partitioning e.g. *£37·45 doubled is £37 doubled (£74) plus 45p doubled (90p) giving a total of £74·90* 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* e.g. *312 ÷ 3 is 100 + 4 as 100 × 3 = 300 and 4 × 3 = 12* Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25	We can now use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20, combing the ladder and short methods with which they are familiar. It is still vital that place value and how the method actually works are emphasised and modelled, eg using PV counters: Eg 1234 x 15 = 1 2 3 4 X 1 5 *1 1 2* 6 1 7 0 1 2 3 4 0 *1* 1 8 5 1 0 Choose the most efficient method in any given situation Find simple percentages of amounts e.g. *10%, 5%, 20%, 15% and 50%* Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 e.g. $4 \times {}^{2}/_{3} = {}^{8}/_{3} = 2\,{}^{2}/_{3}$ Use short division to divide a number with up to 4 digits by a number ≤ 12:	

		Eg 1234 / 5 = $\begin{array}{r} 0\ 2\ 4\ 6\ {}^{4}/_{5} \\ 5\overline{)1^{1}2^{2}3^{3}4} \end{array}$ Give remainders as whole numbers or as fractions Find non-unit fractions of large amounts Turn improper fractions into mixed numbers and vice versa Choose the most efficient method in any given situation	

Mastery of Y5 Learning

Fluency	Problem Solving	Communication	Reasoning

Children are given opportunities to use their calculation skills in real-life contexts to solve problems and through games.

Calculations are deliberately presented in different ways, eg with symbols replacing numbers or numbers missing, in order to stretch and challenge as well as ensuring deep understanding.

They are encouraged to explain their system for working out a problem and justify how they know their answer/statement is correct, through higher-order questioning and use of talk partners, and are pushed to record these thought processes on paper understandably and irrefutably.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

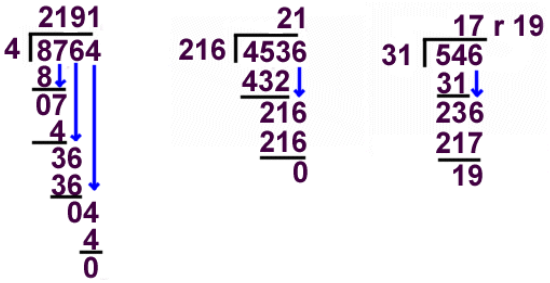
Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Day to day opportunities are found to highlight real-life application Maths.
Children are challenged to use the full range of mathematical ideas and operations they have learned so far, eg through 'Countdown'-style challenges.

Year 6

	Mental calculation	Written calculation	Support to Achieve
Y6 + -	Know by heart number bonds to 100 and use these to derive related facts e.g. *3·46 + 0·54* Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition e.g. *1000 – 654 as 46 + 300 in our heads* Derive, quickly and without difficulty, number bonds to 1000 Add or subtract small and large whole numbers where the use of place value or number facts makes the calculation do-able mentally e.g. *34 000 + 8000* Add or subtract multiples of powers of 10 and near multiples of the same e.g. *6345 + 199* Use number bonds to 1 and 10 to perform mental addition or subtraction (using complementary addition) of any pair of 1-place or 2-place decimal numbers including money e.g. *10 – 3·65 as 0·35 + 6* e.g. *£50 – £34·29 as 71p + £15* Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places e.g. *467 900 – 3005* e.g. *4·63 – 1·02*	Use column addition to add numbers with up to 5 digits Use column addition to add decimal numbers with up to 3 decimal places Add mixed numbers and fractions with different denominators	Place Value counters are now the predominant resource that is modelled as a tactile support, and this includes decimal values. ICT is used to provide interactive games to reinforce learning, and make links with home (eg through 'Activelearn'). Related vocabulary is taught explicitly and displayed prominently. Visual and tactile resources are used to represent fractions eg fraction walls and fraction wheels. Children are taught how tactile resources can be used to represent decimal values, and the similarities to calculating with decimals and with whole numbers are therefore made explicit. Decimal and fraction number lines are displayed prominently. Weekly Times Table challenges, again to lay secure foundations for future learning. Games are used to help learn these tables. Kinaesthetic strategies are used , for example 'moving' children to demonstrate the effect of multiplying or dividing by 10 or 100. Place Value grids are available, and their use modelled. Example 'Number Fact Families', matched to the expectations of mental maths for the year group, are displayed in the classroom.

	Add or subtract with negative numbers in a context such as temperature where the numbers make sense		
Y6 **×**	Know by heart all the multiplication facts up to 12 × 12 Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000 e.g. *234 × 1000 = 234 000* e.g. *0·23 × 1000 = 230* Identify common factors, common multiples and prime numbers and use factors in mental multiplication e.g. *326 × 6 is 652 × 3 which is 1956* Use place value and number facts in mental multiplication e.g. *4000 × 6 = 24 000* e.g. *0·03 × 6 = 0·18* 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 a quarter of 28 × 100 = 700* Use rounding in mental multiplication e.g. *34 × 19 as (34 × 20) – 34* Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning e.g. *3·6 × 4 is 12 + 2·4* e.g. *2·53 × 3 is 6 + 1·5 + 0·09* 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)*	Use short multiplication to multiply a 1-digit number by a number with up to 4 digits Use long multiplication to multiply a 2-digit number by a number with up to 4 digits Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money Multiply fractions and mixed numbers by whole numbers Multiply fractions by proper fractions Use percentages for comparison and calculate simple percentages	

Y6 **÷**	Know by heart all the division facts up to 144 ÷ 12 Divide whole numbers by powers of 10 to give whole number answers or answers with up to 3 decimal places Identify common factors, common multiples and primes numbers and use factors in mental 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 division strategies, for example to divide by 2, 4, 8, 5, 20 and 25 e.g. *628 ÷ 8 is halved three times: 314, 157, 78·5* Divide 1- and 2-place decimals by numbers up to and including 10 using place value e.g. *2·4 ÷ 6 = 0·4* e.g. *0·65 ÷ 5 = 0·13* e.g. *£6·33 ÷ 3 = £2·11* 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)* 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	Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number Use long division (emphasising the 'chunking' that is actually happening to make a link with their previous methods in Years 3 and 4)to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers:  Give remainders as whole numbers or as fractions or as decimals Divide a 1-place or a 2-place decimal number by a number ≤ 12 using multiples of the divisors Divide proper fractions by whole numbers	

Mastery of Y6 Learning

Fluency	Problem Solving	Communication	Reasoning

Children are given opportunities to use their calculation skills in real-life contexts to solve problems and through games.

Calculations are deliberately presented in different ways, eg with symbols replacing numbers or numbers missing, in order to stretch and challenge as well as ensuring deep understanding.

They are encouraged to explain their system for working out a problem and justify how they know their answer/statement is correct, through higher-order questioning and use of talk partners, and are pushed to record these thought processes systematically on paper - understandably and irrefutably.

Oral/Mental starters to lessons revisit prior learning and core concepts to aid fluency.

Previously allocated games remain available on the 'Activelearn' site, and children are encouraged to revisit these.

Planning from Abacus is adapted so that more links are made between topics and opportunities are added for more extended investigative work.

Meaningful cross-curricular links and further opportunities to apply their learning are woven into our 'Cornerstones' Imaginative Learning Projects.

Day to day opportunities are found to highlight real-life application Maths.

Children are challenged to use the full range of mathematical ideas and operations they have learned so far, in all of the above strategies.