Northwick Park

Academy Trust

Calculation Policy for Mathematics

Purpose of our Calculation Policy

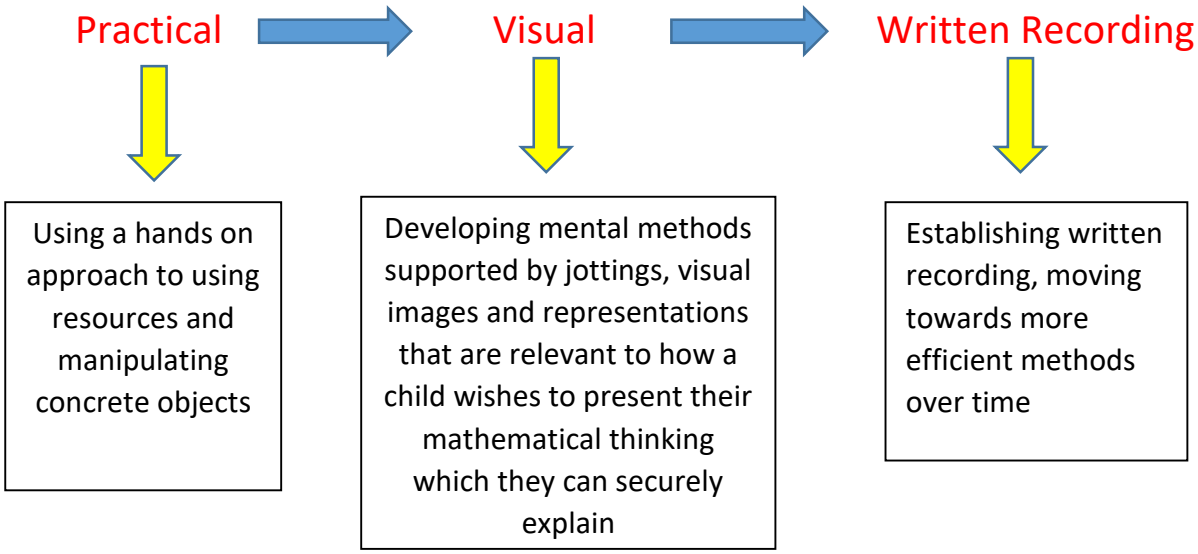
This policy has been written in accordance with the National Curriculum 2014. It is designed to provide pupils with a consistent and fluent progression of learning when using the four main operations.

The calculation policy is organised according to age related expectations as set out in the National Curriculum 2014, however it is vital that pupils are taught according to the stage that they are currently working at, moving on when they are secure. Decisions about when to progress should always be based on the security of the pupils' understanding. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.

It is important that any type of calculation is given a real life context of problem solving approach to help build pupils' understanding of the purpose of calculations, and to help them recognise when to use certain operations and methods.

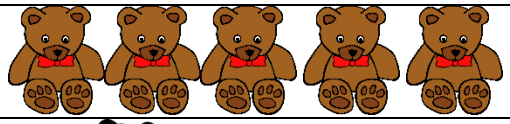
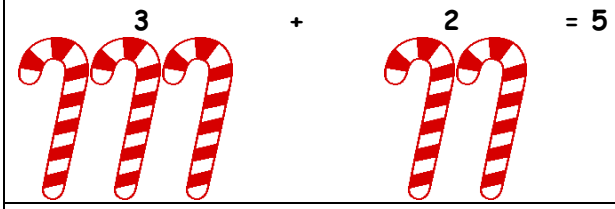
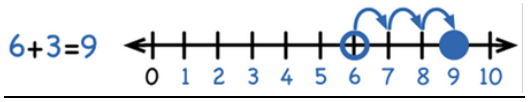
Whilst this policy focuses on written methods of calculation in mathematics, we recognise the importance of the mental strategies and know that these, alongside known facts form the basis of all calculations.

We also understand that pupils need to experience a range of resources and have different representations shown to them to enable them to understand concepts and build on their own experiences when moving onto written recordings for calculations.



Addition

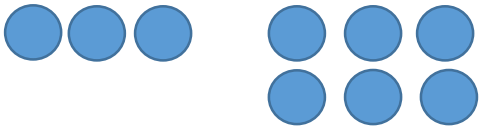
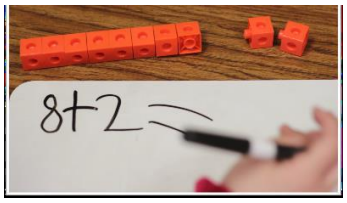
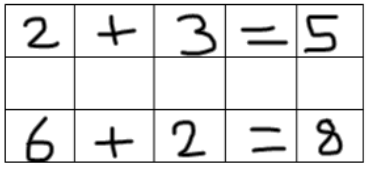
Early Years Add with numbers up to 10

	Count reliably up to 10 objects using 1:1 correspondence.
	Find 1 more than a number to 10 using objects first. Extension – find 1 more on a number line Instant recall of 1 more
	Begin adding by combining two sets of objects into one group (5 cubes and 3 cubes). Add 2 groups together by counting all of them. Understand that addition means adding 2 groups together.
	Only when ready use numbered number lines to add, by counting on in ones. Encourage pupils to start with the **larger** number and count on. Pupils are encouraged to use methods in the inside and outside environment. They develop ways of recording calculations using pictures and objects. They will add two single digit numbers using objects and by counting on, on a number line.

Addition Year 1

Focus: Adding with 1 and 2 digit numbers to 20, including 0.

In Year 1 the pupils will build on their knowledge of numbers to 20 from the Foundation Stage. They will begin by using simple strategies to add two group of objects together and move onto recording their number sentences.

<table>
<tr><td colspan="2">Before moving onto addition Pupils need to be able to:
Form numbers 0-10 (then to 20)
Say numbers in order (at least to 10)</td></tr>
<tr><td>  </td><td>Pupils begin to add units together using physical objects e.g. objects, counters, Numicon shapes.
They count each object to find out how many altogether.
Teacher models the language e.g. 3 cups add 6 cups equals 9 cups altogether.
They begin to record by drawing pictures/marks.</td></tr>
<tr><td> 
</td><td>The teacher models what the adding of two groups looks like in a number sentence.
The pupils begin to copy these number sentences onto whiteboards whilst still using objects to add.</td></tr>
<tr><td> 
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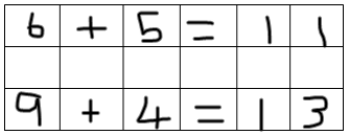
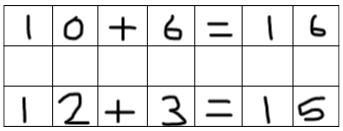
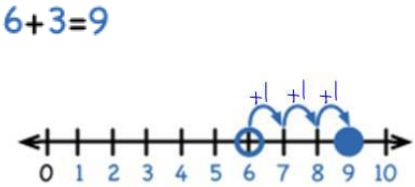
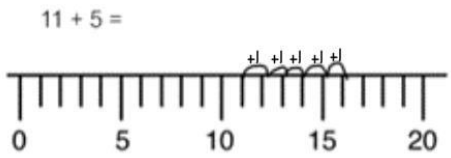
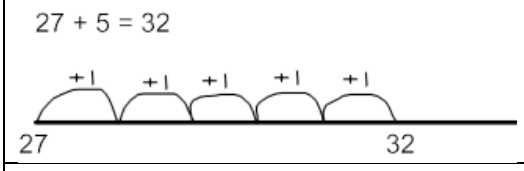
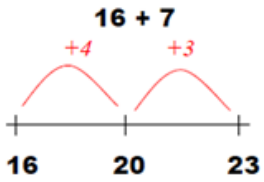
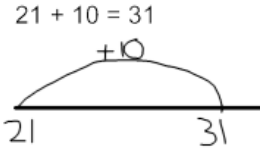
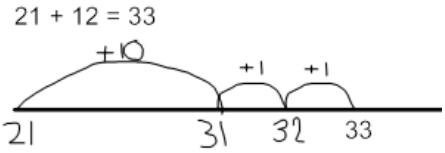
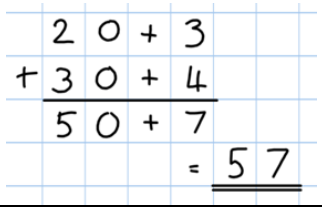
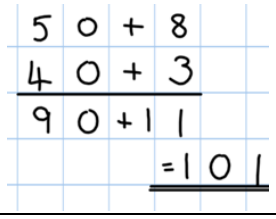
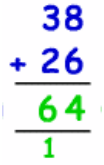
<tr><td> 
</td><td>Pupils begin to add numbers that bridge 10 using the same strategies.
Introduce language of tens and units. Continue to use objects e.g. Numicon.</td></tr>
<tr><td> 
</td><td>Pupils start to add a 1 digit number to a 2 digit number within 20.
Objects are still used to help the addition process.
Begin to bridge 20.</td></tr>
<tr><td> 
</td><td>Pupils are shown how to add using a number line. They record their findings orally to begin with before moving on to drawing the jumps themselves.</td></tr>
<tr><td> 
</td><td>Partial number lines are then used as a transition to blank number lines.</td></tr>
</table>

Addition Year 2

Focus: Adding two 2 digit numbers

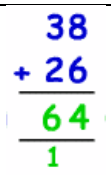
In Year 2 pupils will move to using a blank number line to add 1 and 2 digit numbers. They will learn how to partition 2 digit numbers. They will then move on to a traditional column method.

	The pupils will move onto adding using a blank number line to add a 1 digit number to a rounded 2 digit number e.g. 20 + 7 = . When using this method securely, Pupils move on to bridge 10 whilst still adding units e.g. 27 + 5 =
	Use number bonds to add to the nearest multiple of 10 first.
	Once the pupils can confidently add a 1 digit number to a 2 digit number they can move on to adding two 2 digit numbers. To make it simpler for them they should start by adding rounded tens e.g. 21 + 10. Extend by adding multiple tens e.g. 21 + 20
 48 + 16 = 64 (bridging the 10)	Adding two 2 digit numbers using an open number line using their prior knowledge of adding tens and units. The pupils only need to partition the smaller number to add. When the pupils have secured this skill they can begin to add numbers that bridge through the next ten (use 100 squares etc. to help with number knowledge).
23 + 34 = 	Adding pairs of 2-digit numbers, moving to the partitioned column method when secure adding tens and units. Start by only providing examples that do NOT cross the tens boundary until they are secure with the method itself.
58 + 43 = 	Once pupils can add a multiple of ten to a 2-digit number mentally (e.g. 80+11), they are ready for adding pairs of 2-digit numbers that DO cross the tens boundary (e.g. 58 + 43).
	Now they are ready to move on to the traditional column methods. Introduce this initially with numbers that do not bridge any boundaries. It is important pupils remember that it is thirty add twenty NOT 3 + 2!

Addition Year 3

Focus: Adding with numbers up to 3 digits.

In Year 3 we will develop the use of a traditional column method to solve addition calculations.

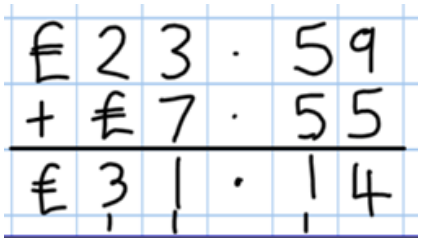
	Ensure pupils are confident using the column method when adding pairs of two digit numbers. It is important pupils remember that it is thirty add twenty NOT 3 + 2!
116 + 343= 459 343 + 116 459	Now pupils are ready to move on to the traditional column methods for adding three digit numbers. Introduce this initially with numbers that do not bridge any boundaries. Reinforce correct place value by reminding them the actual value is 5 hundreds add 3 hundreds, **not 5 add 3**, for example. Please Note: Start by adding the units first.
	Extend to three digit numbers that bridge the tens or hundreds.

Approximate
Calculate
Check

Addition Year 4

Focus: Adding with numbers up to 4 digits.

Year 4 will consolidate their use of the traditional column method and will be able to use it confidently to add numbers up to 4 digits. This could include carrying units, tens and hundreds.

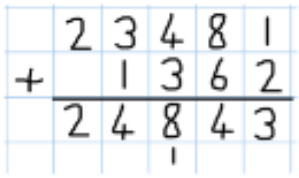
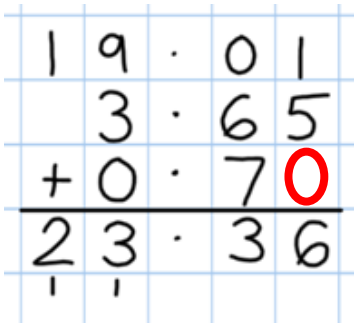
4267 + 1584 = 4267 + 1584 5851 1 1	Pupils should already be familiar with the column method from Year 3 but it is very important to go over the method again ensuring they understand why they start with the units, have to carry a number etc. Please Note: 1) The units must be added first! 2) 'Carry' numbers underneath the bottom line! 3) Reinforce the place value! It is not 6 add 8, it is 6 tens add 8 tens!
	Move onto addition of money using the decimal notation. The decimal point needs to be lined up just like all of the other place value columns and must be remembered in the answer column. It is important pupils understand why this is and get into this habit very quickly.

Approximate
Calculate
Check

Addition Year 5

Focus: Adding with more than 4 digits.

In year 5 pupils will now use the column method to add decimal numbers in the context of money and measures. It is important that pupils have place value skills beyond 4 digits here and fully understand what a decimal number represents.

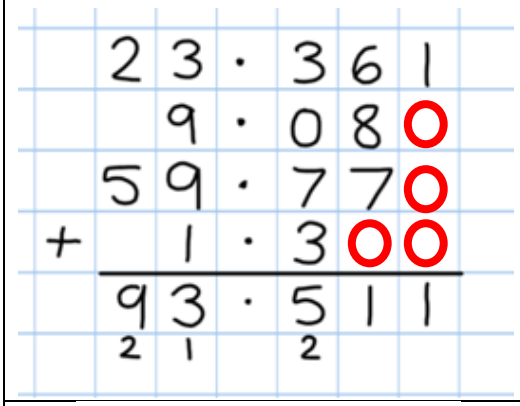
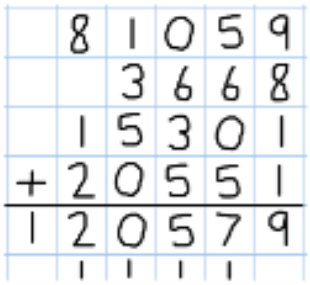
	Pupils should be working with numbers greater than 4 digits including numbers in the ten thousands and hundred thousands.
	Pupils need to start using the column method to add more than two values, still considering place value very carefully. Please Note: 1) It is important that they say 6 tenths add 7 tenths so they understand that they are adding part of a number not a whole number. 2) Empty places should be filled with a zero to show the value of that place.

Approximate
Calculate
Check

Addition Year 6

Focus: Adding several numbers with an increasing level of complexity.

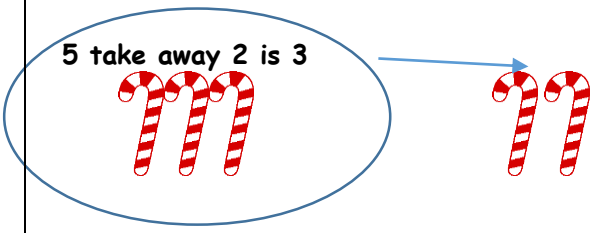
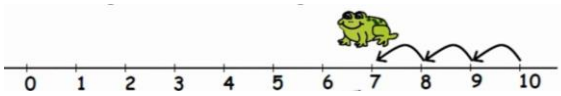
In Year 6 pupils will need to use all of the previous addition skills developed to add several numbers with a variety of different decimal places. Many of these problems will be in the context of money or measure.

	Pupils need to use their knowledge of the decimal point to line up their amounts correctly in the column and use zero as a place holder.
	Pupils should also continue to add multiple integers with 4 digits or more.

Approximate
Calculate
Check

Subtraction

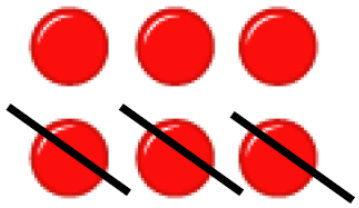
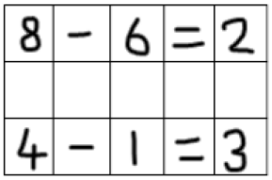
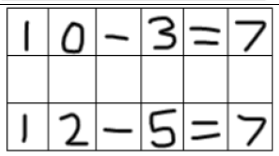
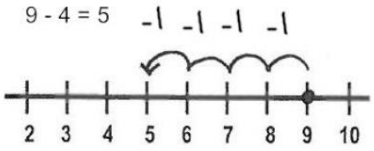
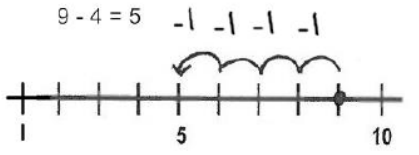
Early Years **Subtract with numbers up to 10**

	Count back reliably from 10 objects using 1:1 correspondence
	Find 1 less than a number to 10 using objects first, Extension – find 1 less on a number line/track Instant recall of 1 less
5 - 2 = 3 	Begin subtraction by taking away 1 or 2 objects from a sets of objects and then counting to find the new total.
10 – 3 = 	Only when ready use numbered number lines to subtract, by counting back in ones. Pupils are encouraged to use methods in the inside and outside environment. They develop ways of recording calculations using pictures and objects. They will subtract two single digit numbers using objects and by counting back on a number line.

Subtraction Year 1

Focus: Subtracting with 1 digit and 2 digit numbers to 20, including 0.

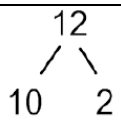
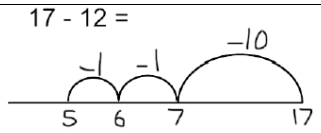
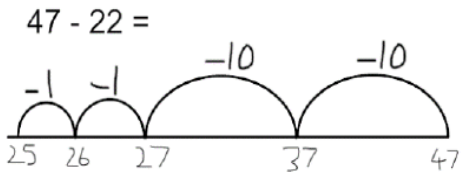
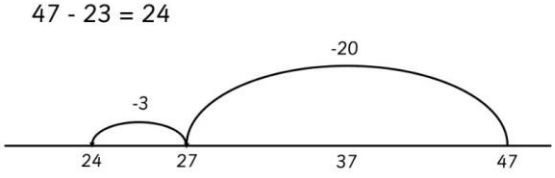
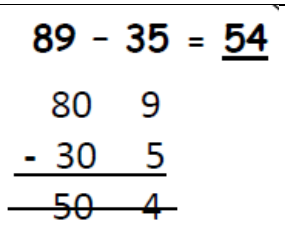
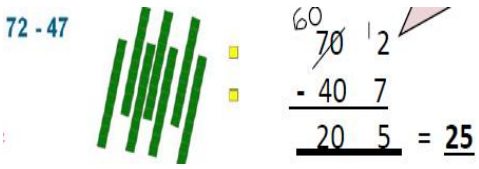
In Year 1 the pupils will build on their knowledge of numbers to 20 from the Foundation Stage. They begin by using simple strategies to subtract from a group of objects and move to recording their number sentences.

	Pupils begin to subtract units from a large group using physical objects e.g. Counters, Numicon shapes. They count each object to find how many left. Teacher models the language e.g. '6 cups take away 3 cups equals 3 cups'. They begin to record by drawing pictures/marks.
	The teacher models what the subtraction looks like in a number sentence. The pupils begin to copy these number sentences onto whiteboards whilst still using objects to help them subtract.
	The pupils become more independent and start to write number sentences into their maths books (squared maths paper) ensuring one digit in each box. Note: Leave a line after each number sentence
	Pupils begin to subtract numbers that bridge 10 using the same strategies. A 1 digit number is subtracted from a 2 digit number. Introduce language of tens and units. Continue to use objects e.g. Numicon.
	Pupils are now shown how to subtract using a number line. They record their findings orally to begin with before moving on to drawing the jumps themselves.
	Partial number lines are then used as a transition to blank number lines.

Subtraction Year 2

Focus: Subtracting with two 2 digit numbers

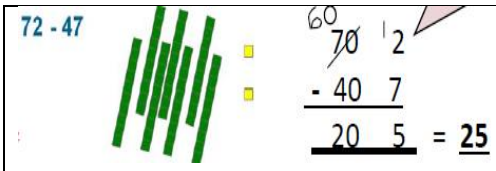
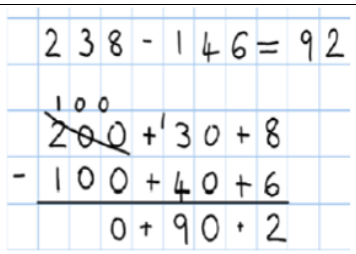
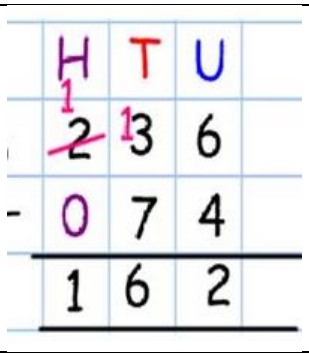
Pupils will begin to count back using a blank number line to subtract. They will use these methods both written and mentally. Once pupils are confident with this method they will move on to partitioning column method of subtraction.

	Pupils now bridge 10 when subtracting units from a two digit number under 20.
	Partitioning is taught (or recapped) so that they can start to subtract two 2 digit numbers.
	Pupils are now ready to subtract tens and units on an open number line. Note: Jump large tens and small units. Biggest number goes at the end of the number line. Only the smaller number needs to be partitioned.
	Continue to increase difficulty by subtracting larger numbers with multiple tens. Note: Work with numbers up to 100.
	Pupils to continue to subtract on an empty number line using efficient jumps by combining multiples of 10.
	Pupils will now have the mental skills required to approach the partitioning column method of subtraction. At first they should attempt this where no exchanging is required.
	Through practical subtraction pupils should be introduced to exchanging. Base 10 is a vital tool here as is a solid grounding with partitioning in different ways. It is important they realise that the value has not changed, we have just partitioned in a different way. As you can see here for 72 – 47, before subtracting 7 units, a tens row will need to be exchanged for 10 units. This method can be compacted when the pupils are ready.

Subtraction Year 3

Focus: Subtracting with 2 and 3 digit numbers

Once pupils become fully confident with the partitioning column method of subtraction they will move onto the compact method of traditional method of column subtraction.

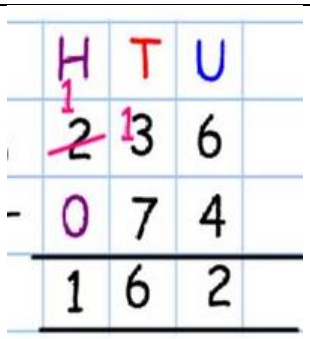
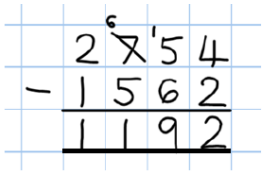
	Through practical subtraction pupils should be introduced to exchanging. Base 10 is a vital tool here as is a solid grounding with partitioning in different ways. It is important Pupils realize that the value has not changed, we have just partitioned in a different way. As you can see here for 72 – 47, before subtracting 7 units, a tens row will need to be exchanged for 10 units. This method can be compacted when the pupils are ready.
	Pupils who are secure with the concept of 'exchanging' should now be able to use the partitioning column method to subtract 2 digit and 3 digit numbers.
	Pupils who are very secure and confident with 3-digit expanded column addition should be moved onto the **compact column** method.

Approximate
Calculate
Check

Subtraction Year 4

Focus: Subtracting with numbers up to 4 digits

Pupils will consolidate their knowledge of using the compact method and extend to using 4 digit numbers. They will be introduced to decimal notation by subtracting money.

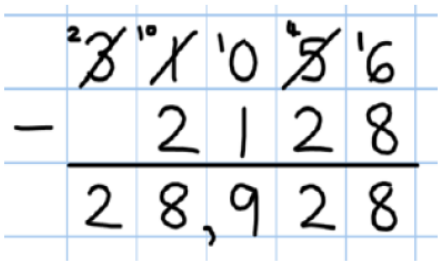
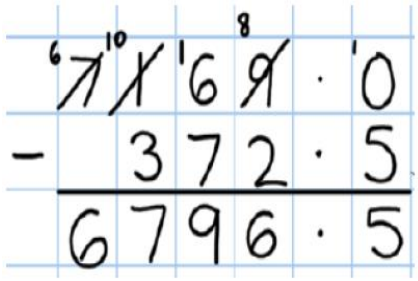
	Ensure pupils are confident with the method and are able to carry.
	Pupils move on to apply this method to using 4 digit numbers.
	Once this skill is used confidently apply to subtracting money and introducing decimal notation. Ensure the pupils line the decimal point correctly and understand why i.e. £ and p.

Approximate
Calculate
Check

Subtraction Year 5

Focus: Subtracting with numbers beyond 4 digits including decimals

Pupils in Year 5 will continue to use the compact column method of subtraction to solve problems including those where exchanging is required. They will subtract larger integers and begin to subtract decimal amounts.

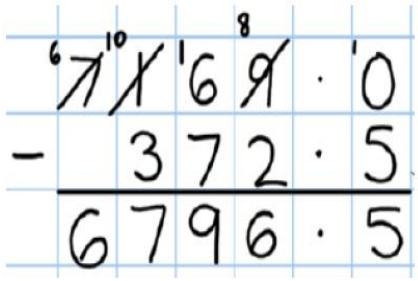
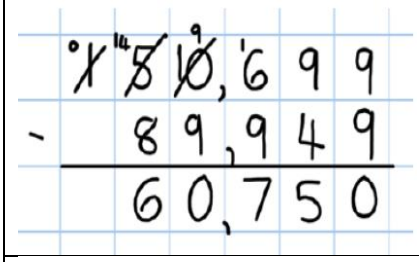
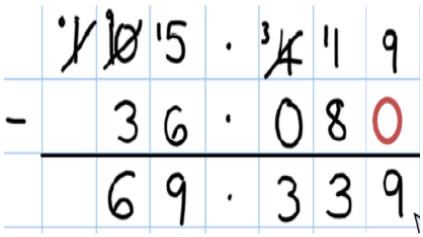
	Ensure pupils can confidently use compact method to subtract money using decimal notation.
	Pupils will come across problems where exchanging will need to take place several times to complete the problem.
	Once confident with large integers, pupils will now be ready to move onto decimal numbers including lots in the context of measures and money. It is important that the pupils line up the decimal point and understand why they are doing this. Please Note: Where there is a space in a column it is important that they put a zero so they understand the value and know what to subtract in that column.

Approximate
Calculate
Check

Subtraction Year 6

Focus: Subtracting with increasingly complex numbers including decimals

In Year 6, pupils need to use mental methods and the compact column method of subtraction to solve an increasingly complex range of calculation including those with integers, those with decimals and those with mixed numbers.

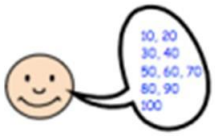
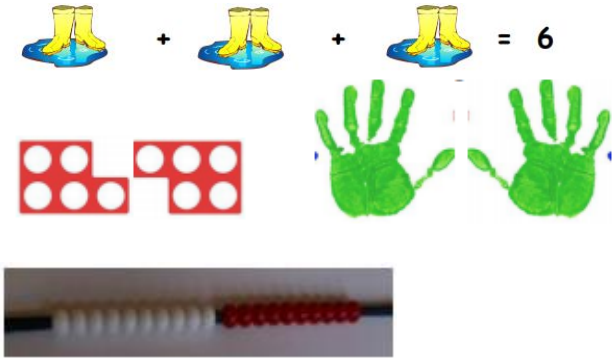
	Ensure pupils can confidently subtract using decimal numbers. It is important that the pupils line up the decimal point and understand why they are doing this.
	Pupils will use the compact method to solve problems involving integers up to 6 digits and beyond and solve problems where they will need to use 'exchanging' several times.
	They will also solve problems in context involving increasingly large decimals. They will need to continue using their knowledge of decimal points to line up their numbers and place a zero in any empty places so that they fully understand the value of that column.

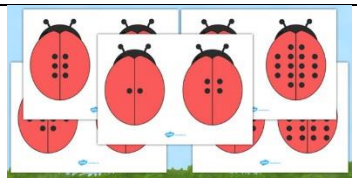
Approximate
Calculate
Check

Multiplication

Early Years **Multiply with concrete objects using repeated addition.**

<table>
<tr><td colspan="2">By the end of Reception, pupils are expected to understand the concept of doubling and to be able to double up to 10. Before doubling can be introduced, children need to have a secure knowledge of counting, number facts and addition in order to double.

 
</td></tr>
<tr><td> 
</td><td>Real life contexts and use of practical equipment to count in repeated groups of the same size.

Also chanting in 2s, 5s and 10s.
They are encouraged to solve real life problems e.g. If one pair of wellington boots = 2 then 3 pairs = 6
They are encouraged to draw pictures and represent their mathematical thinking through various representations e.g. Bead strings, Numicon, cubes</td></tr>
<tr><td>  </td><td>Pupils are encouraged to find doubles by creating two groups of the same size.
This will be explored during play and problem solving activities.</td></tr>
</table>

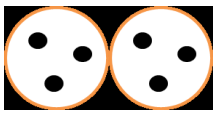
Multiplication Year 1

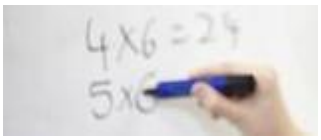
Focus: Solving one step multiplication problems.

In Year 1 the pupils will begin to learn how to multiply. They will work on simple multiplication problems using tangible objects and pictorial recording.

<table>
<tr><td colspan="2">Before moving onto multiplication pupils need to be able to
Have a secure understanding of addition and subtraction
Begin to count in multiples of 2, 5 and 10</td></tr>
<tr><td>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?

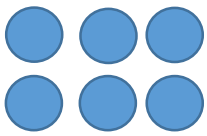
 

3+3+3+3+3 = 15</td><td>The teacher gives verbal instructions showing children how to ‘multiply’ the same amount of objects e.g. I give out 3 sweets and I do the same thing 4 times’. The pupils use objects first including Numicon plates, moving to pictorial representations when ready.</td></tr>
<tr><td>  </td><td>The written multiplication sentence will be modelled by the teacher and the pupils will start to copy onto whiteboards/into their books.
3 x 2 =</td></tr>
<tr><td>How many legs will 3 teddies have?

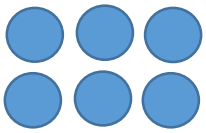
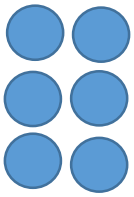
2 + 2 + 2 = 6
3 x 2 = 6</td><td>Pupils solve simple problems using objects or pictorial representations. Writing the repeated addition number sentence and the multiplication number sentence.</td></tr>
<tr><td>3 x 2 =

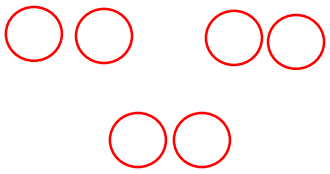
  </td><td>If ready, pupils can be shown how to use an array to solve multiplication calculations.</td></tr>
</table>

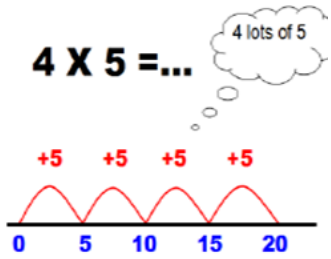
Multiplication Year 2

Focus: Solving problems involving multiplication

In Year 2 pupils will move from basic multiplication arrays and will be taught different strategies including repeated addition and mental methods

<table>
<tr><td colspan="2">Throughout the year pupil should be working on learning to recall their times table facts for 2, 5 and 10. They will also learn to count in steps of 3.</td></tr>
<tr><td>3 x 2 = 6  2 x 3 = 6  </td><td>Pupils should know how to use arrays to solve simple multiplication calculations.

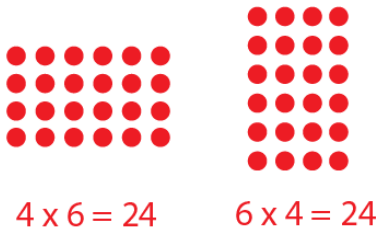
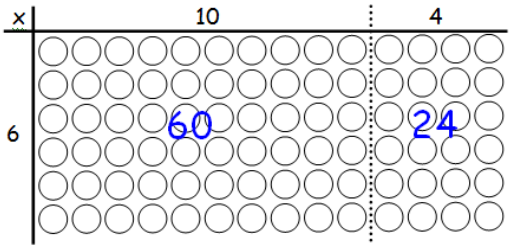
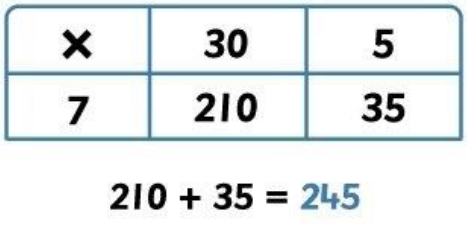
They will be shown that multiplication of two numbers can be done in any order (commutative) and will use arrays to represent this. Physical objects/drawings will be used to aid working out</td></tr>
<tr><td> 
2 + 2 + 2 = 6
3 x 2 = 6</td><td>Repeated addition will be taught as another strategy for multiplication.

This will first be taught by grouping using physical objects or drawings as an aid for working out.</td></tr>
<tr><td> 
</td><td>This then moves on to using a number line for repeated addition. Starting from zero, make equal jumps on a number line to work out the multiplication facts and write the multiplication number sentences.</td></tr>
</table>

Multiplication Year 3

Focus: Multiplying 2 digit numbers by 1 digit numbers.

In Year 3 children will move on from arrays and start using the grid method of multiplication. **It is essential that before pupils move onto the grid method they are completely confident with all previous methods and have a solid grounding with mental methods and partitioning.**

<table>
<tr><td colspan="2">Throughout the year pupils need to learn their multiplication facts for 2, 3, 4, 5, 8 and 10.</td></tr>
<tr><td> 
</td><td>Consolidate their understanding of arrays from year 2.</td></tr>
<tr><td> 
</td><td>The grid method can be introduced using an arrays model. Pupils need to use their partitioning skills to partition the two digit number and then use their existing knowledge of arrays to come to an answer.</td></tr>
<tr><td> 
</td><td>Multiplication grid method requires good organisation but also a solid understanding of partitioning and multiplication facts. The pupils need to remember that once they have multiplied the partitioned parts of the number, they then need to add the two.</td></tr>
</table>

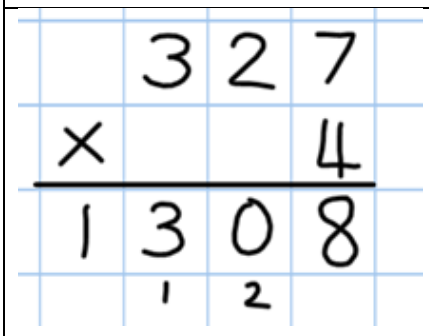
Approximate
Calculate
Check

Multiplication Year 4

Focus: Multiplying 2 and 3 digit numbers by 1 digit numbers.

In Year 4 pupils will consolidate their use of grid method if needed before moving on to using the compact 'short' method for multiplication.

<table>
<tr><td colspan="2">Throughout the year pupils need to learn to recall multiplication facts for all tables up to 12 x 12.</td></tr>
<tr><td>
<table>
<tr><td>×</td><td>30</td><td>5</td></tr>
<tr><td>7</td><td>210</td><td>35</td></tr>
</table>
210 + 35 = 245

613 x 5 =
We partition 613 into 600 and 10 and 3 and put it in a table.
<table>
<tr><td>x</td><td>600</td><td>10</td><td>3</td></tr>
<tr><td>5</td><td>3000</td><td>50</td><td>15</td></tr>
</table>
Add up 3000, 50 and 15 to make 3065.
613 x 5 = 3065
</td><td>Consolidate their understanding of grid method and extend to multiplying a 3 digit number by a single digit.</td></tr>
<tr><td>
1 4
× 3
1 2 (3 x 4)
+ 3 0 (3×10)
4 2
</td><td>Introduction of the written multiplication method should be alongside the grid method so that comparisons can be made. Begin using a ladder method with clear steps.</td></tr>
<tr><td>
3 1 4
× 3
1 2 (3 x 4)
3 0 (3 x 10)
+ 9 0 0 (3 x 300)
9 4 2
</td><td>This can be extended to 3 digit numbers multiplied by 1 digit numbers.</td></tr>
<tr><td>


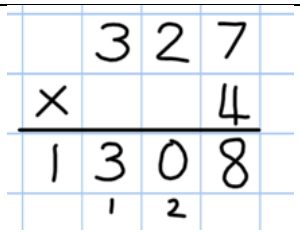
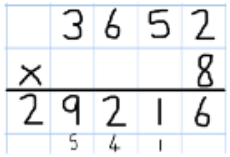
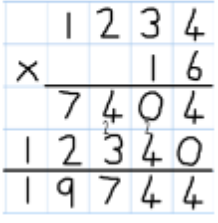
</td><td>When pupils are confident you can take away the written calculations from the side to make it. Ensure they understand each step.

Approximate
Calculate
Check</td></tr>
</table>

Multiplication Year 5

Focus: Multiplying up to 4 digits by 1 or 2 digits.

In year 5 pupils will continue to use short multiplication to solve increasingly richer problems that involve multiplying by 1 digit. They will then move on to long multiplication for problems that involve multiplying by 2 digits. Approximation will play an important part with children making approximations before using long multiplication to help check their answer is correct.

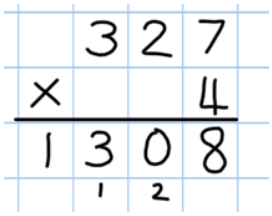
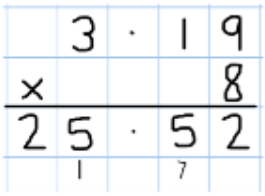
	Consolidate understand of short multiplication from Year 4.
	Pupils will use short multiplication in a range of increasingly challenging problems.
32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 56 X 27 392 (x7) 1120 (x20) 1512 372 x 23 1116 7440 8556	When multiplying by more than 1 digit, pupils need to use long multiplication. Pupils could be encouraged to write what they are multiplying by down the side as an aid until they become confident.
	Pupils can then use long multiplication to solve more challenging problems which require greater levels of calculation.

Approximate
Calculate
Check

Multiplication Year 6

Focus: Consolidating short and long multiplication, multiplying decimals by 1 digit

In Year 6 pupils will consolidate all they know about short and long multiplication. They will also learn the new skills of using short multiplication to multiply decimal numbers to decimal places.

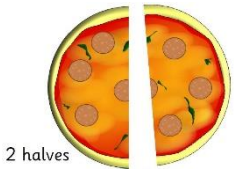
 	Consolidate understanding of short and long multiplication.
	When multiplying decimals it is important to remember that the digit you are multiplying by needs to be lined up with the ones digits. As with all decimal work, the decimal points must be lined up and the pupils need to have a clear understanding why that is.

Approximate
Calculate
Check

Division

Early Years **Group and share small quantities**

<table>
<tr><td colspan="2">By the end of Reception, pupils are expected to understand equal groups and share out items in play and problem solving.

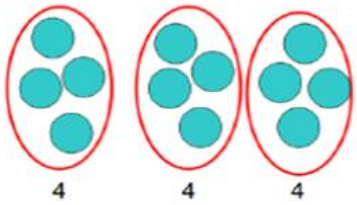
Activities might include:
· Sharing of milk at break time
· Sharing sweets on a child's birthday
· Sharing activities in the home corner</td></tr>
<tr><td> 

 </td><td>They are encouraged to find half of objects and numbers by sharing into 2 equal groups.</td></tr>
<tr><td>  </td><td>Sharing into equal groups
The pupils will share objects into equal groups and count how many in each group.</td></tr>
<tr><td></td><td>Grouping
Pupils will begin to understand equal groups and group items in play and problem solving. They will start to count in 2s and 10s and later in 5s.</td></tr>
</table>

Division Year 1

Focus: Solve one step division problems.

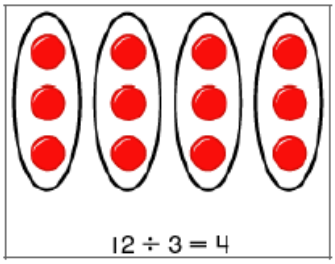
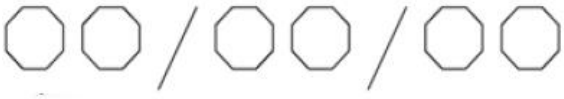
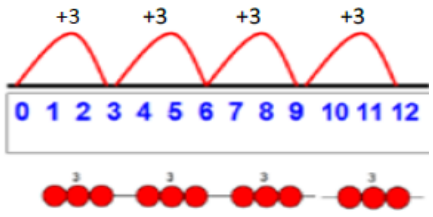
Pupils in year 1 will begin to learn how to divide. They will work on simple division problems using tangible objects and pictorial recording.

Sharing:  12 shared between 3 is 4	The pupils will start by sharing objects between set groups e.g. 12 sweets shared between 3 pupils. They will discuss how to share equally so no group has more or less.
4 ÷ 2 = 2 4 ÷ 2 =  2	The written division sentence will be modelled by the teacher and the pupils will start to copy onto whiteboards/into their books. Pupils will begin to use arrays to work out division calculations by drawing rings around each 'group'.

Division Year 2

Focus: Solve problems involving division

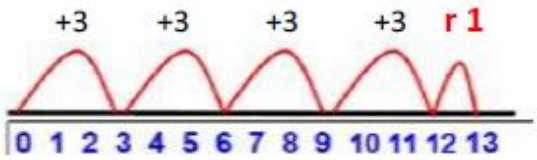
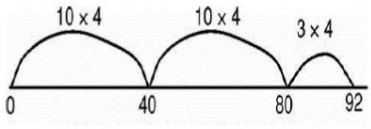
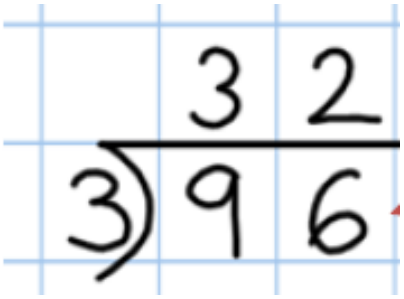
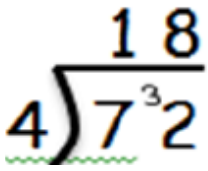
Pupils in year 2 will use objects, arrays, diagrams and pictorial representations, and grouping on a number line. Pupils will be encouraged to use their knowledge of multiplication to solve division.

12 ÷ 3 = 4 	Pupils will consolidate their understanding of division as sharing using objects and visual representations. They will then move on to division as grouping using objects such as bead strings.
Arrays: 	This represents 12 ÷ 3, posed as how many groups of 3 are in 12? Pupils should also show that the same array can represent 12 ÷ 4 =3 if grouped horizontally.
There are 6 sweets, how many people can have 2 sweets each? 	**Mastery** Pupils should be taught to recognise whether problems require sharing or grouping.
 **12 ÷ 3 = 4**	**Grouping using a number line** Group from zero in equal jumps of the divisor to find out 'How many groups of _ in _ ?' Pupils could and using a bead string or practical apparatus to work out problems like: 'A CD costs £3. How many CDs can I buy with £12?' **This is an important method to develop understanding of division as grouping.**

Division Year 3

Focus: Dividing 2 digit numbers by 1 digit numbers moving from number line methods to short division.

Pupils in year 3 will continue to use a number line to solve division problems and will begin to jump more than one step at a time in the style of 'chunking'. Once confident they will move on to short division without any remainders.

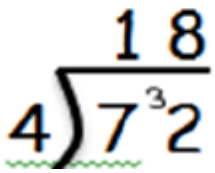
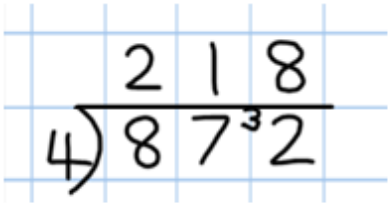
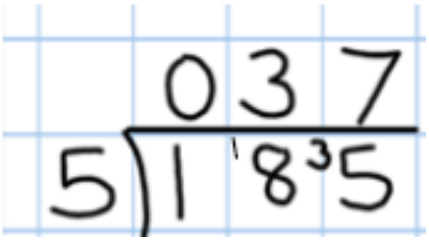
Grouping on a number line: **13 ÷ 3 = 4 r 1**  	Pupils continue to work out unknown division facts by grouping on a number line from zero. They are also now taught the concept of remainders, as in the example. This should be introduced practically and with arrays, as well as being translated to a number line. Pupils should work towards calculating some basic division facts with remainders mentally for the 2s, 3s, 4s, 5s, 8s and 10s, ready for carrying remainders across within the short division method.
 	Once confident pupils will begin to solve problems on a grouping number line involving bigger numbers. To solve this effectively they will need to subtract chunks of the divisor. As you can see in the image for 92 ÷ 4, a step of 10 groups of 4 has been jumped, followed by another step of 10 jumps, and finally followed by a step of 3 jumps of 4. This means that in total 4 was jumped 23 times making 23 the answer.
Short division: Limit numbers to NO remainders in the answer OR carried (each digit must be a multiple of the divisor).  	Once pupils are secure with division as grouping and demonstrate this using number lines, arrays etc., short division for larger 2-digit numbers should be introduced, initially with carefully selected examples requiring no calculating of remainders at all. Remind pupils of correct place value, that 96 is equal to 90 and 6, but in short division, pose: • How many 3's in 9? = 3, and record it above the 9 tens. • How many 3's in 6? = 2, and record it above the 6 units.
Short division: Limit numbers to NO remainders in the final answer, but with remainders occurring within the calculation.  	Once pupils demonstrate a full understanding of remainders, and also the short division method taught, they can be taught how to use the method when remainders occur within the calculation (e.g. 96÷4), and be taught to carry the remainder onto the next digit. If needed, pupils should use the number line to work out individual division facts that occur which they are not yet able to recall mentally.

Approximate
Calculate
Check

Division Year 4

Focus: Consolidating and extending use of short division

Children in year 4 will continue to use short division to solve division problems. They will work on problems where there are remainders in the first numbers but not in the final answer.

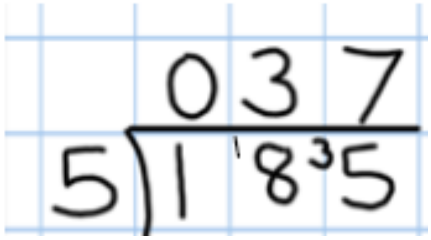
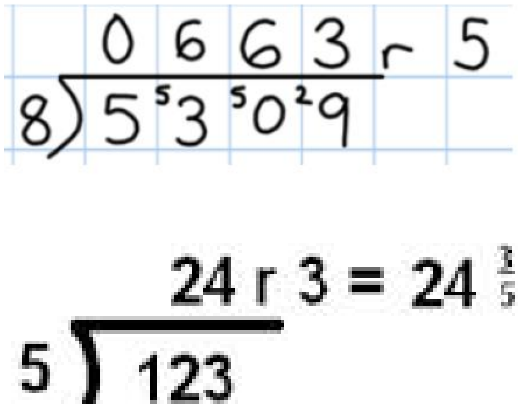
Short division: Limit numbers to NO remainders in the final answer, but with remainders occurring within the calculation.  	Pupils must be secure with the process of short division for dividing 2-digit numbers by a single digit (those that do not result in a final remainder), but must understand how to calculate remainders, using this to carry remainders within the calculation process.
 	Pupils move onto dividing numbers with up to 3-digits by a single digit, however, problems and calculations provided should not result in a final answer with remainder at this stage. **Real life contexts need to be used routinely to help pupils gain a full understanding, and the ability to recognise the place of division and how to apply it to problems.**
 	When the answer for the first column is zero (1 ÷ 5, as in example), pupils could initially write a zero above to acknowledge its place, and must always carry the number (1) over to the next digit as a remainder. Include money and measure contexts when confident.

Approximate
Calculate
Check

Division Year 5

Focus: Extending use of short multiplication to 4 digits and remainders

Pupils in year 5 will use short division to solve problems up to 4 digits long. For the first time they will use short division to solve problems that have a remainder in the final answer.

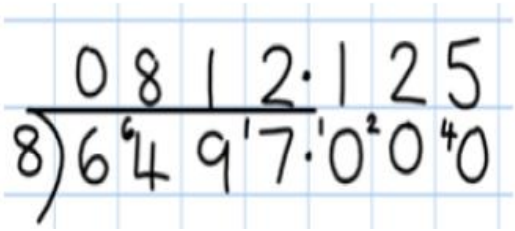
	Consolidate using short division taught in Year 4. When the answer for the first column is zero (1 ÷ 5, as in example), pupils could initially write a zero above to acknowledge its place, and must always carry the number (1) over to the next digit as a remainder. Include money and measure contexts when confident.
	In year 5 pupils will begin to solve division problems where a number up to 4 digits is divided by a single digit number including answers with remainders. These division problems need to be contextual so the pupils learn how to express the remainder- as a number or a fraction.
18 ÷ 8 = 8⟌18 = 8⟌ 2. / 18.²0 8 goes into 18 twice remainder 2. Put in a zero. = 8⟌ 2.2 / 18.²0⁴0 8 goes into 20 twice remainder 4. Put in a zero. = 8⟌ 2.25 / 18.²0⁴0 8 goes into 40 five times exactly	When confident pupils can be taught to express the reminder as a decimal. Calculating a decimal remainder: In this example, rather than expressing the remainder as r 2, a decimal point is added after the units because there is still a remainder, and the remainder is carried onto zeros after the decimal point (to show there was no decimal value in the original number). Pupils to be instructed to extend the division line as they add

Approximate
Calculate
Check

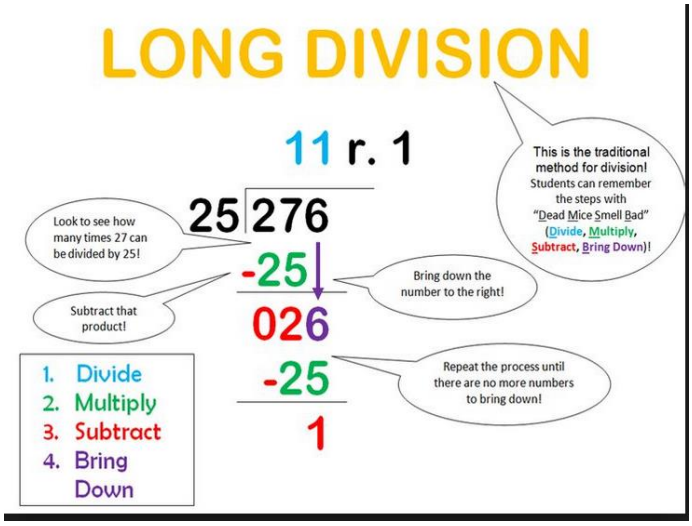
Division Year 6

Focus: Using short division to divide 4 digit numbers and express remainders as decimals and long division for dividing 2 digit numbers

In year 6, pupils will use short division to divide decimal numbers by single digit numbers. The final step of division will be long division which will be used to divide numbers by 2 digits.



Consolidate the method of short division taught in year 5 and ensure pupils know how to express the remainder as a decimal or a fraction.



If needed, chunking can be used as an introduction for long division.

To divide by 2 digit numbers, the children will use the method of long division. Any remainders would need to be expressed in a way that matched the context of the problem.

Dead Mice Smell Bad could be used as a way of remembering

Divide

Multiply

Subtract

Bring down

Creating a list of magic numbers (useful numbers) will also support pupils with this method.

Extend to 4 digit numbers divided by 2 digit numbers.

Real life contexts need to be used routinely

Approximate
Calculate
Check