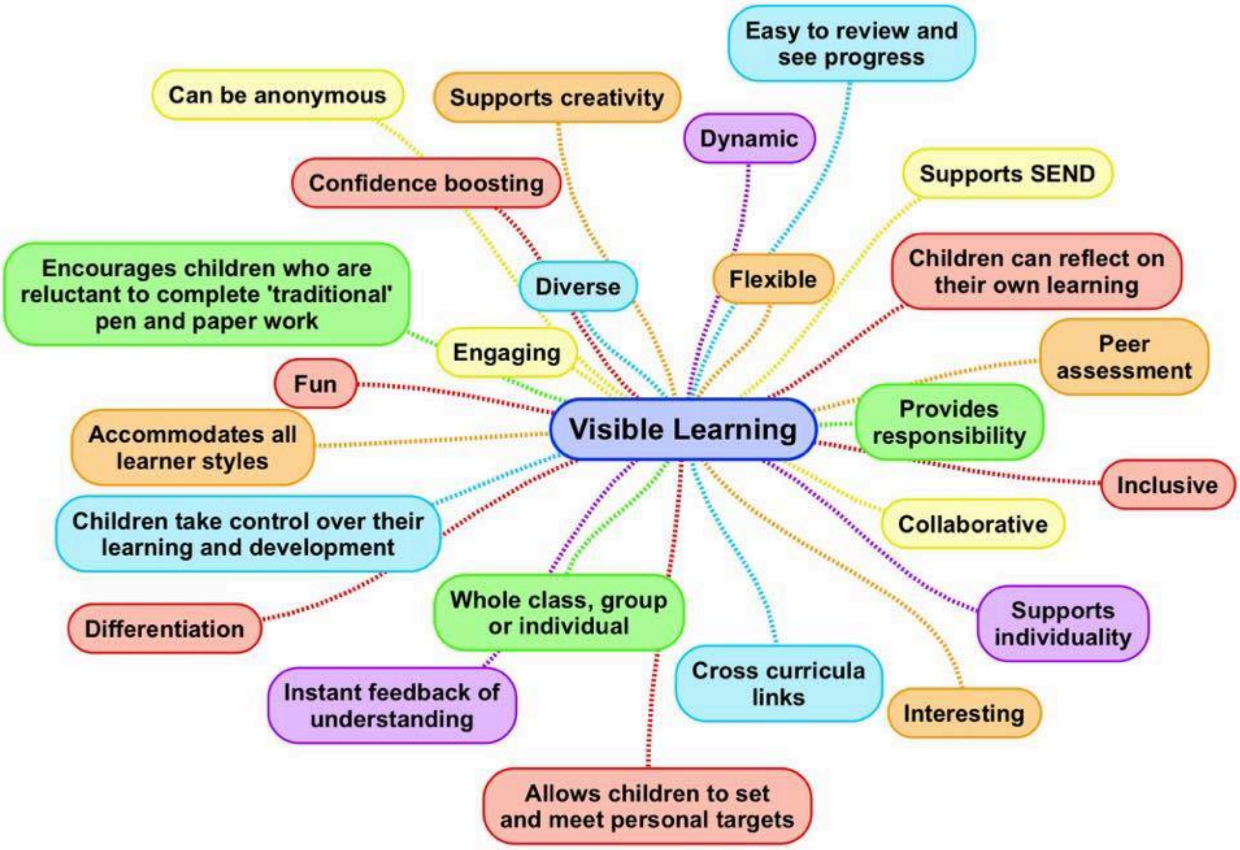
WRITTEN METHODS IN MATHEMATICS POLICY

	Name of School	Whybridge Junior School
	Policy review Date	1st September 2018
	Date of next Review	31st August 2019
	Who reviewed this policy?	Miss A Fairbank

Our teaching pedagogy is rooted in VISIBLE LEARNING



Children are introduced to the processes of calculation through practical, oral and mental activities. As children's mental methods are strengthened and refined, so too are their informal written methods. These methods become more efficient and succinct and lead to efficient written methods that can be used more generally. By the end of Year 6 children are equipped with mental, written and calculator methods that they understand and can use correctly. When faced with a calculation, children are able to decide which method is most appropriate and have strategies to check its accuracy. At whatever stage in their learning, and whatever method is being used, it must still be underpinned by a secure and appropriate knowledge of number facts, along with those mental skills that are needed to carry out the process and judge if it was successful. (Guidance on Calculation, Primary Mathematics Framework, National Strategies)

At Whybridge Junior School, our methods of calculation focus on stages the children are at in their learning, rather than by year group. That way, we are differentiating for the needs of our children in our class. It is important to follow this policy as a rule as each child moves up through the school to ensure consistent teaching approaches in the mathematics lessons.

The overall aim is that when children leave primary school they:

- have a secure knowledge of number facts and a good understanding of the four operations;
- are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using one-digit and two-digit numbers and particular strategies to special cases involving bigger numbers;
- make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
- have an efficient, reliable, compact written method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally.

The objectives in the revised Framework show the progression in children's use of written methods of calculation from Year 2 to Year 6

Year 2

- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
- Use the symbols +, -, × , ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. ? ÷ 2 = 6, 30 - ? = 24)
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

Year 3

- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Year 4

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate-solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout

Year 5

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Year 6

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division

Addition

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. These notes show the stages in building up to using an efficient written method for addition of whole numbers by the end of Year 4.

To add successfully, children need to be able to:

- recall all addition pairs to 9 + 9 and complements in 10;
- add mentally a series of one-digit numbers, such as 5 + 8 + 4;
- add multiples of 10 (such as 60 + 70) or of 100 (such as 600 + 700) using the related addition fact, 6 + 7, and their knowledge of place value;
- partition two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways.

Note: It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for addition.

<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><th colspan="2">Stage 1: The empty number line</th></tr>
<tr><td>

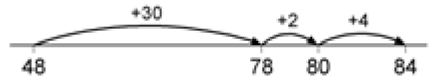
- The mental methods that lead to column addition generally involve partitioning, e.g. adding the tens and ones separately, often starting with the tens. Children need to be able to partition numbers in ways other than into tens and ones to help them make multiples of ten by adding in steps.
- The empty number line helps to record the steps on the way to calculating the total.

</td><td>

Steps in addition can be recorded on a number line. The steps often bridge through a multiple of 10.

8 + 7 = 15

48 + 36 = 84



or:

</td></tr>
<tr><th colspan="2">Stage 2: Partitioning</th></tr>
<tr><td>

- The next stage is to record mental methods using partitioning. Add the tens and then the ones to form partial sums and then add these partial sums.
- Partitioning both numbers into tens and ones mirrors the column method where ones are placed under ones and tens under tens. This also links to mental methods.

</td><td>

Record steps in addition using partitioning:

47 + 76
40 7 70 6

Partitioned numbers are then written under one another:

$$\begin{array}{rcl} 47 & = & 40 + 7 \\ +76 & & 70 + 6 \\ \hline & & 110 + 13 = 123 \end{array}$$

</td></tr>
<tr><th colspan="2">Stage 3: Expanded method in columns</th></tr>
<tr><td>

- The addition of the tens in the calculation 47 + 76 is described in the words 'forty plus seventy equals one hundred and ten', stressing the link to the related fact 'four plus seven equals eleven'.
- The expanded method leads children to the more compact method so that they understand its structure and efficiency. The amount of time that should be spent teaching and practising the expanded method will depend on how secure the children are in their recall of number facts and in their understanding of place value.

</td><td>

Write the numbers in columns.

Adding the ones first:

$$\begin{array}{r} 47 \\ +\ 76 \\ \hline 13 \\ 110 \\ \hline 123 \end{array}$$

</td></tr>
</table>

Method	Example
Stage 4: Column method	
• In this method, recording is reduced further. Carry digits are recorded below the line, using the words 'carry ten' or 'carry one hundred', not 'carry one'. • Later, extend to adding three two-digit numbers, two three-digit numbers and numbers with different numbers of digits.	47 + 76 123 11 258 + 87 345 11 366 +458 824 11 Column addition remains efficient when used with larger whole numbers and decimals. Once learned, the method is quick and reliable. 4.7 + 27.6 32.3 11

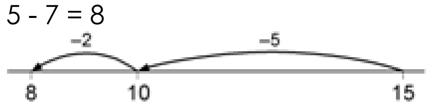
Subtraction

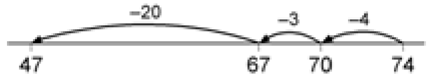
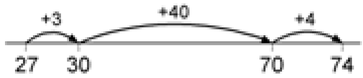
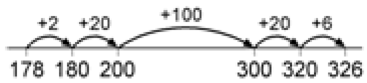
The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. These notes show the stages in building up to using an efficient method for subtraction of two-digit and three-digit whole numbers by the end of Year 4.

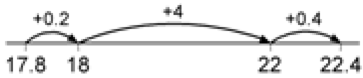
To subtract successfully, children need to be able to:

- recall all addition and subtraction facts to 20
- subtract multiples of 10 (such as 160 - 70) using the related subtraction fact, f16 - 7, and their knowledge of place value
- partition two-digit and three-digit numbers into multiples of one hundred, ten and one in different ways (e.g. partition 74 into 70 + 4 or 60 + 14).

Note: It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for subtraction.

Method	Example
Stage 1: Using the empty number line	
• The empty number line helps to record or explain the steps in mental subtraction. A calculation like 74 - 27 can be recorded by counting back 27 from 74 to reach 47. The empty number line is also a useful way of modelling processes such as bridging through a multiple of ten. • The steps can also be recorded by counting up from the smaller to the larger number to	Steps in subtraction can be recorded on a number line. The steps often bridge through a multiple of 10. 15 - 7 = 8 

Method	Example
find the difference, for example by counting up from 27 to 74 in steps totalling 47. • With practice, children will need to record less information and decide whether to count back or forward. It is useful to ask children whether counting up or back is the more efficient for calculations such as 57 - 12, 86 - 77 or 43 - 28. The notes below give more detail on the counting-up method using an empty number line.	74 - 27 = 47 worked by counting back:  The steps may be recorded in a different order:  or combined: 
The counting-up method	
• The mental method of counting up from the smaller to the larger number can be recorded using either number lines or vertically in columns. The number of rows (or steps) can be reduced by combining steps. With two-digit numbers, this requires children to be able to work out the answer to a calculation such as 30 + ? = 74 mentally.	 74 − 27 3 40 4 47 Or:  74 − 27 3 44 47
• With three-digit numbers the number of steps can again be reduced, provided that children are able to work out answers to calculations such as 178 + ? = 200 and 200 + ? = 326 mentally. • The most compact form of recording remains reasonably efficient.	 326 −178 2 20 100 26 148

Method	Example
	Or:  326 −178 22 126 148
• The method can be used with decimals where no more than three columns are required. However, it becomes less efficient when more than three columns are needed. • This counting-up method can be a useful alternative for children whose progress is slow, whose mental and written calculation skills are weak and whose projected attainment at the end of Key Stage 2 is towards the lower end of level 4.	 22.4 −17.8 0.2 4.0 0.4 4.6 Or:  22.4 −17.8 0.2 →18 4.4 →22.4 4.6
Stage 2: Partitioning	
• Subtraction can be recorded using partitioning to write equivalent calculations that can be carried out mentally.	Subtraction can be recorded using partitioning: 74 – 27 74 - 20 - 7 = 54 - 7 = 47
Stage 3: Expanded layout, leading to column method	
• Partitioning the numbers into tens and ones and writing one under the other mirrors the column method, where ones are placed under ones and tens under tens. • This does not link directly to mental methods of counting back or up but parallels the partitioning method for addition. It also relies on secure mental skills. • The expanded method leads children to the more compact method so that they understand its structure and efficiency. The amount of time that should be spent teaching	Partitioned numbers are then written under one another: **Example: 78 – 27** 70 + 8 - 20 + 7 50 + 1 = 51 **Example: 74 - 27**

<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><td>and practising the expanded method will depend on how secure the children are in their recall of number facts and with partitioning.</td><td>70 + 4
− 20 + 7

(60) (14)
<s>70</s> + <s>4</s>
− 20 + 7
40 + 7

(6) (14)
<s>7</s> <s>4</s>
− 2 7
4 7

Example: 741 - 367

700 + 40 + 1
− 300 + 60 + 7

(600) (130) (11)
<s>700</s> + <s>40</s> + <s>1</s>
− 300 + 60 + 7
300 + 70 + 4

(6) (13) (11)
<s>7</s> <s>4</s> <s>1</s>
− 3 6 7
3 7 4</td></tr>
<tr><td colspan="2">The expanded method for three-digit numbers</td></tr>
<tr><td></td><td>Example: 503 – 278, dealing with zeros when adjusting

500 + 0 + 3
− 200 + 70 + 8

400 + 90 + 13
− 200 + 70 + 8
200 + 20 + 5

(4) (9) (13)
<s>5</s> <s>0</s> <s>3</s>
− 2 7 8
2 2 5</td></tr>
</table>

Multiplication

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

These notes show the stages in building up to using an efficient method for two-digit by one-digit multiplication by the end of Year4, two-digit by two-digit multiplication by the end of Year 5, and three-digit by two-digit multiplication by the end of Year 6.

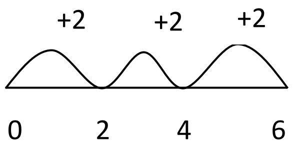
To multiply successfully, children need to be able to:

- recall all multiplication facts to 10 × 10
- partition number into multiples of one hundred, ten and one
- work out products such as 70 × 5, 70 × 50, 700 × 5 or700 × 50 using the related fact 7 × 5 and their knowledge of place value
- add two or more single-digit numbers mentally
- add multiples of 10 (such as 60 + 70) or of 100 (such as 600 + 700) using the related addition fact, 6 + 7, and their knowledge of place value
- add combinations of whole numbers using the column method (see above).

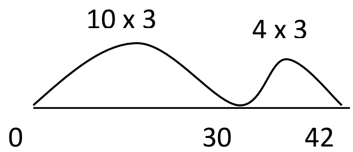
Note: It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for multiplication. In Year 3, children use apparatus, arrays and number lines jumps for those having difficulty.

2 x 3 as an array

OOO or OO
OOO   OO
           OO



<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><th colspan="2">Stage 1: Mental multiplication using partitioning</th></tr>
<tr><td>Mental methods for multiplying TO × O can be based on the distributive law of multiplication over addition. This allows the tens and ones to be multiplied separately to form partial products. These are then added to find the total product. Either the tens or the ones can be multiplied first but it is more common to start with the tens.</td><td>Informal recording in Year 4 might be:
43
40 + 3
↓ ↓ × 6
240 + 18 = 258

Also record mental multiplication using partitioning:
14 x 3
10 x 3 = 30
4 x 3 = 12
30 + 12 = 42

</td></tr>
<tr><th colspan="2">Stage 2: The grid method</th></tr>
<tr><td>As a staging post, an expanded method which uses a grid can be used. This is based on the distributive law and links directly to the mental method. It is an alternative way of recording the same steps.</td><td>38 × 7 = 210 + 56 = 266
<table><tr><th>×</th><th>7</th></tr><tr><td>30</td><td>210</td></tr><tr><td>8</td><td>56</td></tr><tr><td></td><td>266</td></tr></table>The step here involves adding 210 and 50 mentally with only the 5 in the 50 recorded. This highlights the need for children to be able to add a multiple of 10 to a two-digit or three-digit number mentally before they reach this stage.</td></tr>
<tr><th colspan="2">Stage 3: Expanded short multiplication</th></tr>
<tr><td>The next step is to represent the method of recording in a column format, but showing the working. Draw attention to the links with the grid method above.
Children should describe what they do by referring to the actual values of the digits in the columns. For example, the first step in 38 × 7 is 'thirty multiplied by seven', not 'three times seven', although the relationship 3 × 7 should be stressed.</td><td> 38
X   7
  56
210
266</td></tr>
</table>

Method	Example
• Most children should be able to use this expanded method for TO × O by the end of Year 4.	
Stage 4: Short multiplication	
• The recording is reduced further, with carry digits recorded below the line. • If, after practice, children cannot use the compact method without making errors, they should return to the expanded format of stage 3.	38 × 7 266 5 This can be used for decimals too however we teach children to remove the decimal point and make a note of how many decimal places were in the answer to begin with. Children then ensure there is the same number of decimal places left in the answer. 3.8 X 7 26.6 5
Stage 5: Long multiplication	
• Extend to TO × TO, asking children to estimate first. • This is the same method as short multiplication however with another digit • Children are taught to describe what they do by referring to the actual values of the digits in the columns. For example, the first step in 124 x 26 is 'four multiplied by six', and then it is 'twenty multiplied by six' not 2 times 6, although the relationship 2 x 6 should be stressed. • Children are then taught to remember to put their 'place holder' in the ones column when moving onto multiplying by the second digit 'twenty' which the children refer to as '2' Children are taught this as they are now multiplying with a number in the tens column so the place holder ensures the answer will be ten times bigger.	124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

Method	Example
• Reduce the recording, showing the links to the grid method above.	56 × 27 is approximately 60 × 30 = 1800. 56 × 27 1000 $50 \times 20 = 1000$ 120 $6 \times 20 = 120$ 350 $50 \times 7 = 350$ 42 $6 \times 7 = 42$ 1512 1
• Reduce the recording further. • The carry digits in the partial products of 56 × 20 = 120 and 56 × 7 = 392 are usually carried mentally. • The aim is for most children to use this long multiplication method for TU × TU by the end of Year 5. • This can be extended to HTU x TU etc.	56 × 27 is approximately 60 × 30 = 1800. 56 × 27 1120 56×20 392 56×7 1512 1

Division

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. These notes show the stages in building up to long division through Years 4 to 6 - first long division TO ÷ O, extending to HTO ÷ O, then HTO ÷ TO, and then short division HTO ÷ O.

To divide successfully in their heads, children need to be able to:

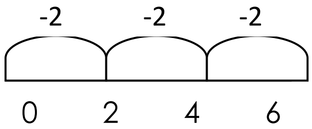
- understand and use the vocabulary of division - for example in 18 ÷ 3 = 6,the 18 is the dividend, the 3 is the divisor and the 6 is the quotient
- partition two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways
- recall multiplication and division facts to 10 × 10, recognise multiples of one-digit numbers and divide multiples of 10 or 100 by a single-digit number using their knowledge of division facts and place value
- know how to find a remainder working mentally - for example, find the remainder when 48 is divided by 5
- understand and use multiplication and division as inverse operations.

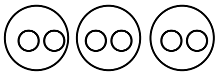
Note: It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for division.

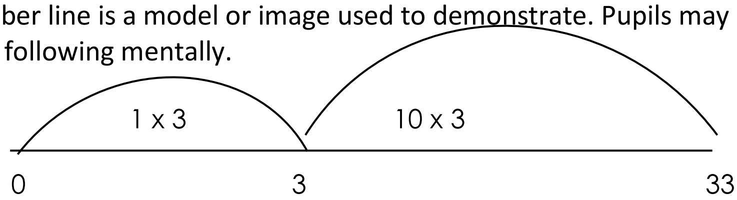
To carry out written methods of division successful, children also need to be able to:

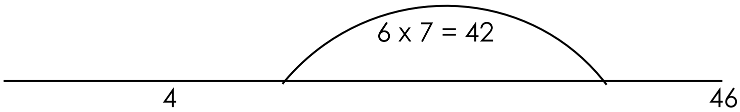
- understand division as repeated subtraction
- estimate how many times one number divides into another - for example, how many sixes there are in 47, or how many 23s there are in 92
- multiply a two-digit number by a single-digit number mentally
- subtract numbers using the column method.

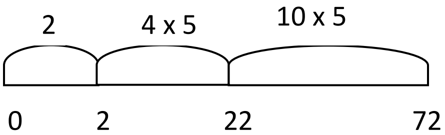
In Year 3, children may start with repeated subtraction, sharing/grouping using apparatus, using the inverse, using halving as the opposite of doubling, using language such as: how many 3s in 15? How many 2s in 6?





<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><td colspan="2">Stage 1: Mental division using partitioning</td></tr>
<tr><td colspan="2">
Strategies, Models and Images
The empty number line is a model or image used to demonstrate. Pupils may use jottings or calculate the following mentally.
33 ÷ 3


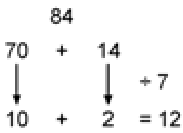
Using knowledge of multiplication and division facts to find remainders e.g.
46 ÷ 6 = 7 r 4


72 ÷ 5 =
Can we subtract 10 lots of 5?
How many other lots of 5 can we subtract?


</td></tr>
<tr><td>

Mental methods for dividing TU ÷ U can be based on partitioning and on the distributive law of division over addition. This allows a multiple of the divisor and the remaining number to be divided separately. The results are then added to find the total quotient.
Many children can partition and multiply with confidence. But this is not the case for division. One reason for this may be that mental methods of division, stressing the correspondence to mental methods of multiplication, have not in the past been given enough attention.
Children should also be able to find a remainder mentally, for example

</td><td>
One way to work out TU ÷ U mentally is to partition TU into a multiple of the divisor plus the remaining ones, then divide each part separately.

Informal recording in Year 4 for 84 ÷ 7 might be:


In this example, using knowledge of multiples, the 84 is partitioned into 70 (the highest multiple of 7 that is also a multiple of 10 and less than 84) plus 14 and then each part is divided separately using the distributive law.
</td></tr>
</table>

<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><td>the remainder when 34 is divided by 6.</td><td>Another way to record is in a grid, with links to the grid method of multiplication.
<table><tr><td>×</td><td></td><td></td></tr><tr><td>7</td><td>70</td><td>14</td></tr></table>
→
<table><tr><td>×</td><td>10</td><td>2</td></tr><tr><td>7</td><td>70</td><td>14</td></tr></table>
10 + 2 = 12

As the mental method is recorded, ask: 'How many sevens in seventy?' and: 'How many sevens in fourteen?'</td></tr>
<tr><th colspan="2">Stage 2: Short division of T0 ÷ 20</th></tr>
<tr><td>
'Short' division of TO ÷ O can be introduced as a more compact recording of the mental method of partitioning.
Short division of two-digit number can be introduced to children who are confident with multiplication and division facts and with subtracting multiples of 10 mentally, and whose understanding of partitioning and place value is sound.
For most children this will be at the end of Year 4 or the beginning of Year 5.
The accompanying patter is 'How many threes divide into 80 so that the answer is a multiple of 10?' This gives 20 threes or 60, with 20 remaining. We now ask: 'What is 21 divided by three?' which gives the answer 7.
</td><td>For 81 ÷ 3, the dividend of 81 is split into 60, the highest multiple of 3 that is also a multiple 10 and less than 81, to give 60 + 21. Each number is then divided by 3.

The short division method is recorded like this:
$$\begin{array}{r} 20 + 7 \\ 3\overline{)60 + 21} \end{array}$$
This is then shortened to:
$$\begin{array}{r} 2\;7 \\ 3\overline{)8\;{}^{2}1} \end{array}$$
The carry digit '2' represents the 2 tens that have been exchanged for 20 ones. In the first recording above it is written in front of the 1 to show that 21 is to be divided by 3. In second it is written as a superscript.

The 27 written above the line represents the answer: 20 + 7, or 2 tens and 7 ones.</td></tr>
<tr><th colspan="2">Stage 3: 'Expanded' method for HTO ÷ O</th></tr>
<tr><td>
This method is based on subtracting multiples of the divisor from the number to be divided, the dividend.
For TU ÷ U there is a link to the mental method.
As you record the division, ask: 'How many nines in 90?' or 'What is 90 divided by 9?'
Once they understand and can apply the method, children should be able to move on from TU ÷ U to HTO ÷ U quite quickly as the principles are the same.
</td><td>196 ÷ 6=
$$\begin{array}{rrl} & 6\overline{)196} & \\ - & \underline{60} & 6 \times 10 \\ & 136 & \\ - & \underline{60} & 6 \times 10 \\ & 76 & \\ - & \underline{60} & 6 \times 10 \\ & 16 & \\ - & \underline{12} & 6 \times \underline{2} \\ & 4 & \;\;\;32 \\ \text{Answer:} & & \;\;\;32\text{ R }4 \end{array}$$</td></tr>
</table>

<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><td>

This method, often referred to as 'chunking', is based on subtracting multiples of the divisor, or 'chunks'. Initially children subtract several chunks, but with practice they should look for the biggest multiples of the divisor that they can find to subtract.
Chunking is useful for reminding children of the link between division and repeated subtraction.
However, children need to recognise that chunking is inefficient if too many subtractions have to be carried out. Encourage them to reduce the number of steps and move them on quickly to finding the largest possible multiples.

</td><td></td></tr>
<tr><td>

The key to the efficiency of chunking lies in the estimate that is made before the chunking starts. Estimating for HTU ÷ U involves multiplying the divisor by multiples of 10 to find the two multiples that 'trap' the HTU dividend.
Estimating has two purposes when doing a division:

to help to choose a starting point for the division;
to check the answer after the calculation.

Children who have a secure knowledge of multiplication facts and place value should be able to move on quickly to the more efficient recording on the right.

</td><td>
To find 196 ÷ 6, we start by multiplying 6 by 10, 20, 30, … to find that 6 × 30 = 180 and 6 × 40 = 240. The multiples of 180 and 240 trap the number 196. This tells us that the answer to 196 ÷ 6 is between 30 and 40.

Start the division by first subtracting 180, leaving 16, and then subtracting the largest possible multiple of 6, which is 12, leaving 4.

6)196
− 180   6 × 30
   16
− 12   6 × 2
    4   32
Answer: 32 R 4

The quotient 32 (with a remainder of 4) lies between 30 and 40, as predicted.
</td></tr>
<tr><th colspan="2">Stage 4: Short division of HTO ÷ O</th></tr>
<tr><td>

'Short' division of HTO ÷ O can be introduced as an alternative, more compact recording. No chunking is involved since the links are to partitioning, not repeated subtraction.

</td><td>
For 291 ÷ 3, because 3 × 90 = 270 and 3 × 100 = 300, we use 270 and split the dividend of 291 into 270 + 21. Each part is then divided by 3.
$$291 \div 3 = (270 + 21) \div 3$$
$$= (270 \div 3) + (21 \div 3)$$
$$= 90 + 7$$
$$= 97$$
</td></tr>
</table>

<table>
<tr><th>Method</th><th>Example</th></tr>
<tr><td>

The accompanying pattern is 'How many threes in 290?' (the answer must be a multiple of 10). This gives 90threes or 270, with 20 remaining. We now ask: 'How many threes in 21?' which has the answer 7.
Short division of a three-digit number can be introduced to children who are confident with multiplication and division facts and with subtracting multiples of 10 mentally, and whose understanding of partitioning and place value is sound.
For most children this will be at the end of Year 5 or the beginning of Year 6.

</td><td>
The short division method is recorded like this:
$3\overline{)290+1} = \overset{90\,+\,7}{3\overline{)270+21}}$

This is then shortened to:
$\overset{9\;7}{3\overline{)2\;9\;{}^{2}1}}$
</td></tr>
<tr><th colspan="2">Stage 5: Long division</th></tr>
<tr><td>
The next step is to tackle HTU ÷ TU, which for most children will be in Year 6.

The layout on the right, which links to the 'long division' method.

<u>Step 1</u>
Divide- divide 15 into 4-which doesn't work. Divide 15 into 43 which equals 2.

<u>Step 2</u>
Multiply-multiply 15 by 2 which equals 30.
<u>Step 3</u>
Subtract-subtract 30 from 43 which equals 13.
<u>Step 4</u>
Bring down bring down the two to make 132.
Repeat the steps
<u>Step 1</u>
Divide- divide 15 into 132 which equals 8
<u>Step 2</u>
Multiply-multiply 15 by 8 which equals 120

</td><td>
How many packs of 15 can we make from 432 biscuits? Start by multiplying 24 by 1, 2, 3, 4, 5, and 10-you may need to add to your facts during your calculation.

We use the acronym 'Do McDonald's Serve Burgers?' to help children remember correct steps to the question.

$$\begin{array}{r} 2\;8 \\ 1\;5\overline{)4\;3\;2} \\ \underline{3\;0\;\downarrow} \\ 1\;3\;2 \\ \underline{1\;2\;0} \\ 1\;2 \end{array}$$
Answer: 28 r12 = 28 12/15 = 28 4/5
</td></tr>
</table>

Method	Example
• <u>Step 3</u> Subtract-subtract 120 from 132 which equals 12 There would be no more steps as 12 is smaller than 15 and would therefore be our remainder. This would give us an answer of: 28 r12-in year 6 children have to be able to present their answers as a fraction. This would mean our remainder of 12 would become 12/15 as 15 was our divisor. In year 6 children also have to simplify answers and as 12 and 15 are both divisible by three the answer would therefore become 28 4/5	
For Years 5 and 6, children may use remainders expressed as fractions(in their simplest form) or decimals	456 ÷ 5 = 91 ⅕ Or 456 ÷ 5 = 91.2 091.2 5 | $4^{4}56.^{1}0$