Year 3

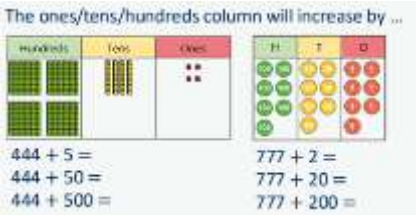
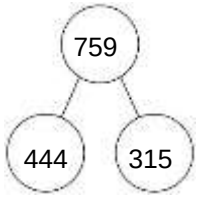
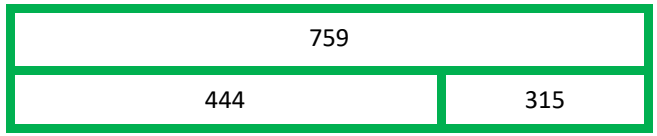
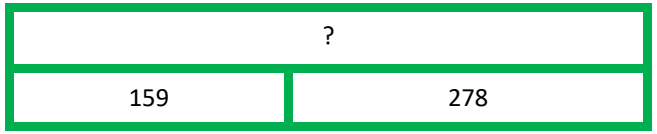
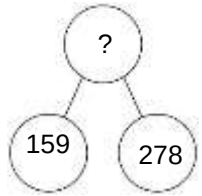
LOWER KEY STAGE 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole 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 become less reliant on 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 (year 4) 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 simplify fractions and find equivalents as well as finding fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, dividing whole numbers by 10 and 100 and seeing the effect on the digits.

	National Curriculum Objectives	Mental calculation	Written calculation
Y3 +	**<u>Add and Subtract numbers mentally, including:</u>** • a three-digit number and 1s • a three-digit number and 10s • a three-digit number and 100s **<u>Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction</u>** **<u>Estimate the answer to a calculation and use inverse operations to check answers</u>**	Use place value knowledge to add a 3-digit number and ones, tens and hundreds up to 1000. Place value grids and counters are used to help children visualise and understand what they are doing mentally.  Children are encouraged to use the basic number facts they know to help them. For example:	**<u>Continue to use part whole models and bar models to represent related addition and subtraction facts.</u>**  444 + 315 = 759 315 + 444 = 759 **So…** 759 – 444 = 315 759 – 315 = 444  **<u>Use to help solve missing number problems/ inverse. Use to check answers to a calculation.</u>** We know that 159 + 278= ? We can help visualise this problem by putting it into a bar model (or part whole model), now we know we need to add them together. We can do 159 + 278 to find our missing number (=437). We can now do 437 – 289 to check. If we get 159 we are correct.  

Adding ones:

5 + 3 = 8 so, 34**5** + **3** = 34**8**

6 + 4 = 10 so, 45**6** + **4** = 460

Adding tens:

70 + 20 = 90 so, 8**7**6 + **2**0 = 8**9**6

Where numbers bridge over 100, children are encouraged to look at the hundreds and tens as a 2-digit number:

891 + 10 = **90**1

Adding hundreds:

400 + 300= 700 so,

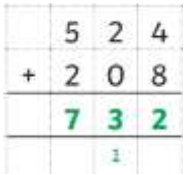
472 + **3**00= **7**72

Relate number bonds to 10 to number bonds to 100 and 1000 (e.g. 3 + 7 = 10 so 30 + 70 = 100 therefore 300 + 700 = 1000 and be able to recall them.

Column addition for up to two 3-digit number, with 1 or more exchanging

Use of column addition with up to two 3-digit numbers (may also do 3 digit number + 2 digit number, or three 3 digit numbers added together etc). May have no exchanging, one exchange or multiple exchanges.

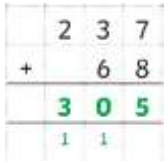
Exchange once



Starting with the ones, add each column in turn. When adding 4 ones + 8 ones = 12 = 1 ten and 2 ones.

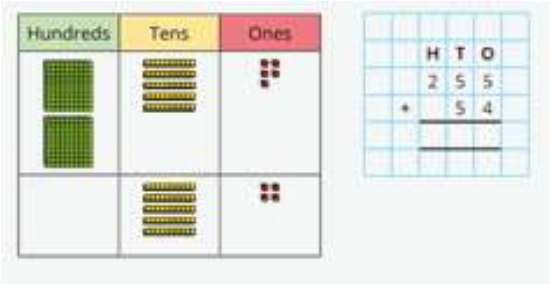
Place 1 ten under the equal sign on the ten column and the 2 ones in the answer ('hang it on the washing line')

Exchange multiple times



Starting with the ones, add each column in turn. Exchange tens and hundreds as required ('hang it on the washing line')

NB: Children to understand commutative law. Numbers can be added in any order and it will not effect the answer.



NB: Emphasis to be made on the place value of each digit so children do not think it is 8 - 7. Ask questions such as 'What is the value of 8 in this calculation?', 'Can you show me this number partitioned?'

Use of place value grids and base 10 to represent exchanging of ten ones for one ten, or ten tens for one hundred.

Estimate the answer to a calculation

Children to look for the nearest multiple of 10 or 100 and add the 2 numbers together to get an estimate.

51 + 29 = ☐ **50 + 30 = 80**

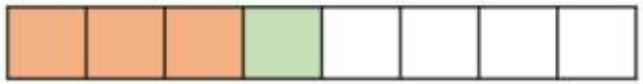
204 + 198 = ☐ **200 + 200 = 400**

Add and subtract fractions with the same denominator within one whole

Add and subtract amounts of money to give change, using both £ and p in practical contexts

Add fractions with the same denominator

- Children use practical equipment and pictorial representations to add two or more fractions with the same denominator where the total is less than 1.
- Children understand that we only add the numerators and the denominators stay the same.

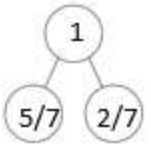


We can use this model to calculate $\frac{3}{8} + \frac{1}{8} = \frac{4}{8}$

NB: Children need to recognise that fractions add to 1 whole

1/3 + 2/3 = 1

3/8 + 5/8 = 1

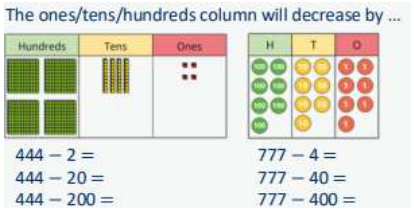
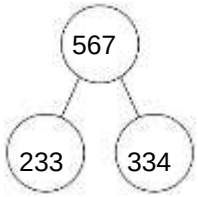
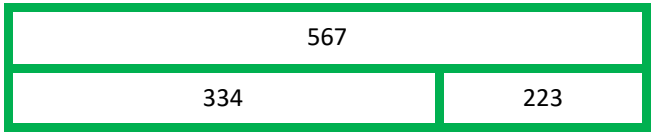
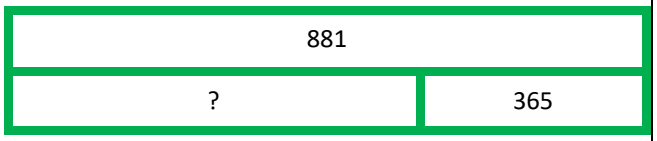
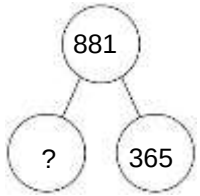


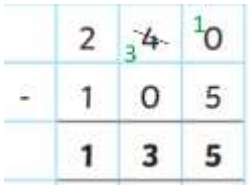
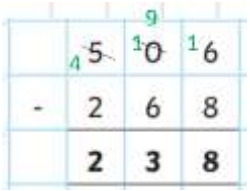
Adding amounts of money

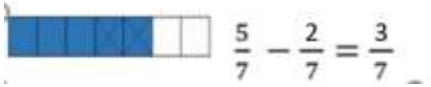
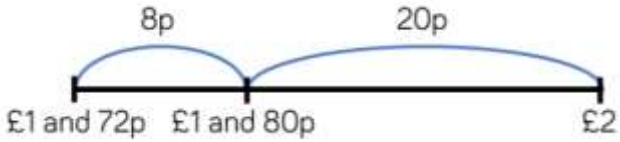
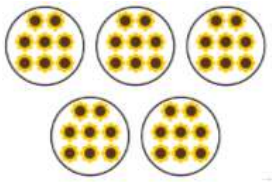
Children add two amounts of money using pictorial representations to support them. They are encouraged to add the pounds first and then add the pence. Children then exchange the pence for pounds to complete their calculations.

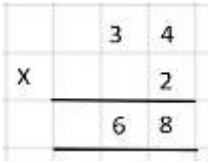
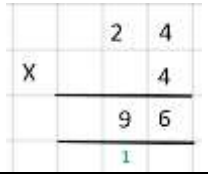
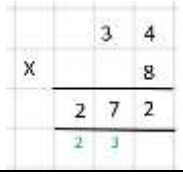
£2 and 35p + £1 and 75 p. There is £3 and 110p. Altogether there is £1 and10p.

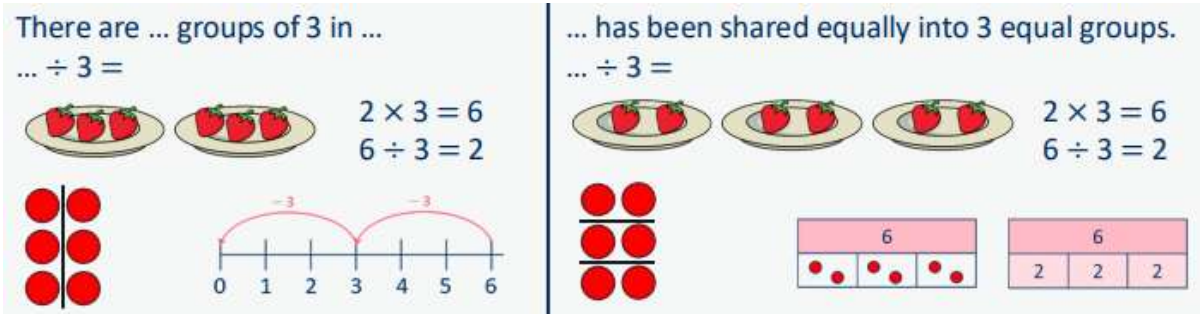
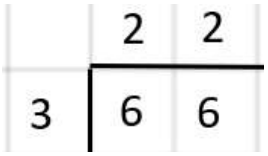
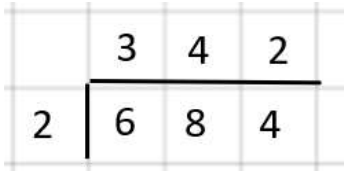
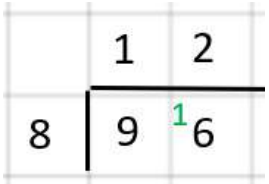
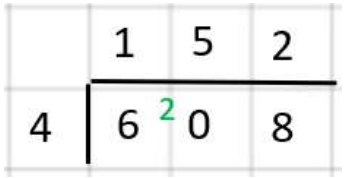
£5 and 30p + £3 and 75p. There is £8 and 105p. Altogether there is £9 and 5p.

	Calculate the time taken by particular events or tasks.		From … to … o'clock is … minutes. From … o'clock to … is … minutes. The total time taken is … minutes 
Y3 –	**Add and subtract numbers mentally, including:** **Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction**	Use place value knowledge to a subtract a 3-digit number and ones, tens and hundreds up to 1000. Place value grids and counters are used to help children visualise and understand what they are doing mentally.  Children are encouraged to use the basic number facts they know to help them. For example: **Subtracting ones:** **5 - 3 = 2** so, 34**5** - **3** = 34**2** **Subtracting tens:** **70 - 20 = 50** so, 8**7**6 - **2**0 = 8**5**6 Where numbers bridge over 100, children are encouraged to look at the hundreds and tens as a 2-digit number:	**Continue to use part whole models and bar models** **Use to represent related addition and subtraction facts.**  233 + 334 = 567 334 + 233 = 567 **So…** 567 – 334 = 233 567 – 233 = 334  **Use to help solve missing number problems and represent inverse**. We know that 781 - ? = 365 We can help visualise this problem by putting it into a bar model (or part whole model) like on the right. Now we can see the other subtraction we need to do. We now know we can do 881 – 365 to find our missing number which is 516   **Column subtraction for up to two 3-digit number, with 1 or more exchange** Use of (compact) column subtraction with up to two 3-digit numbers (may also do 3-digit number – 2 digit number etc). May have no exchanging, one exchange or multiple exchanging.

		801 - 10 = **79**1 **Subtracting hundreds:** **400 – 300 = 100** so, **4**72 - **3**00= **1**72	**One exchange**  Starting with the ones, subtract each column in turn. When subtracting 0 ones from 5 ones, exchange 1 ten from the tens column to make 1 ten and 4 ones (14). Change the 4 tens into 3 tens. NB: Emphasis to be made on the place value of each digit so children do not think it is 2 - 1. Ask questions such as 'What is the value of 2 in this calculation?', 'Can you show me this number partitioned?' **Multiple exchanging**  Starting with the ones, subtract each column in turn. Exchange in the tens / hundreds as required
	Estimate the answer to a calculation and use inverse operations to check answers		**Estimation:** Children to look for the nearest multiple of 10 or 100 and subtract the 2 numbers to get an estimate. **59 – 31 =** ☐ **60 – 30 = 30** **598 - 203 =** ☐ **600 - 200 = 400**
	Add and subtract fractions with the same denominator within one whole		**Subtract fractions with the same denominator** Children use practical equipment and pictorial representations to subtract fractions with the same denominator within one whole.

	Add and subtract amounts of money to give change, using both £ and p in practical contexts		Children understand that we only subtract the numerators and the denominators stay the same. Use the models to help you subtract the fractions.  $\frac{5}{7} - \frac{2}{7} = \frac{3}{7}$ **Subtracting amounts of money** Children use different methods to subtract money. They will see examples where they can physically remove the coins, and examples where they will need to use their knowledge of converting money to exchange £1 for 100 pence. Children also use number lines to count on or back to calculate the difference between two amounts.  Alex has £3 and 50p. She gives £2 and 10p to her sister. How much money does she have left? £3 − £2 = £1. 50p − 10p = 40p. Alex has £1 and 40p remaining.  Tommy has £1 and 72p. Rosie has £2 How much more money does Rosie have than Tommy? Rosie has 28p more than Tommy
Y3 ×	**Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables** **Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental**	Know by heart all the multiplication facts in the ×3, ×4 and ×8 tables Recognise that multiplication is commutative 3 x 5 = 15 5 x 3 = 15 NB: Reinforce division facts as inverse of multiplication throughout teaching.	 Understanding multiplication as equal groups of and that multiplication is commutative. There are 3 equal groups of 4. 3 x 4 = 12 or 4 x 3 = 12  There are 5 equal groups of 8. 5 x 8 = 40 or 8 x 5 = 40 Using known multiplication facts and partitioning to answer 2 digit by 1digit calculations :

	and progressing to formal written methods	Multiplying by 1 Know that any number x by 1 = itself **For example: 8 x 1 = 8** Multiplying by 0 Know that any number x by 0= 0	 3 2 x 3 = 30 2 30 x 3 = 90 (3 x 3) 2 x 3 = 6 30 + 6 = 36 **Formal written method: 2 digit numbers by 1 digit number (2, 3, 4, 5 and 8 times tables)** **No exchanging**  **With Exchanging**   NB: Emphasis to be made on the place value of each digit so children do not think it is 2 x 3 . Ask questions such as 'What is the value of 3 in this calculation?', 'Can you show me this number partitioned?'

Y3 ÷	**Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables**	Know by heart all the division facts derived from the ×2, ×3, ×4, ×5, ×8 and ×10 tables. Recognise that division is not commutative Use place value and number facts in mental division Check that Children can halve even numbers to 100, halve odd numbers to 20 NB: Reinforce multiplication facts as inverse of division throughout teaching columns.	**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** To understand division as equal groupings and sharing equally:  **Bus stop method: (2 and 3 digit, multiples of 2, 3, 4, 5 and 8- no remainders)** **No exchanging**   NB: Emphasis to be made on the place value of each digit so children do not think it is 3 ÷ 6. Ask questions such as 'What is the value of 6 in this calculation?', 'Can you show me this number partitioned?' **With exchanging**   **Diagrams to help:** 1 equal group of 8 and 1 remaining  1 equal group of 4 and 2 remaining 

	Unit fractions of a set of objects **Non-unit fractions of a set of objects**	Use multiplication and division facts to find fractions of sets of objects.