Perryfields Junior School

Calculation Policy 2018

This calculation policy is intended to bring consistency, continuity and progression as methods build upon each other from year 3 to year 6.

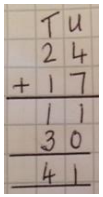
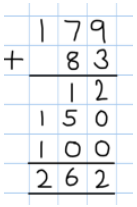
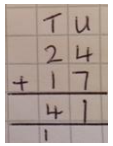
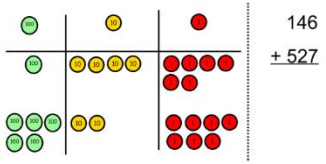
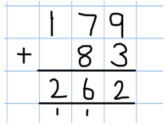
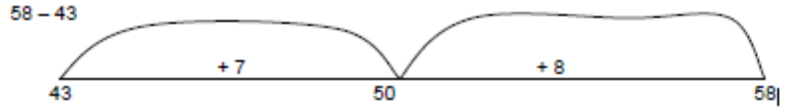
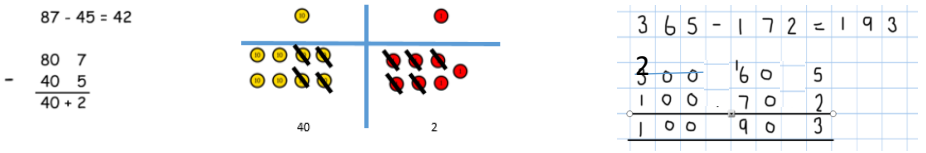
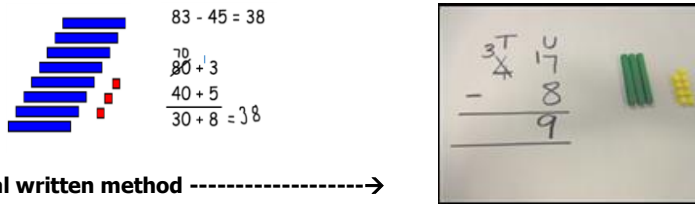
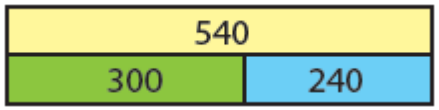
It is essential that rapid recall of key number facts is embedded prior to written calculations being taught. This is necessary as the written calculations outlined in this policy rely on mental strategies to process numbers efficiently and with confidence. Therefore, mental strategies are included within this policy.

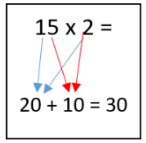
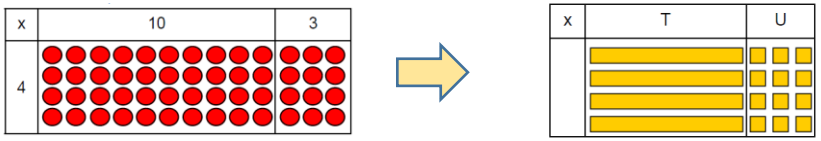
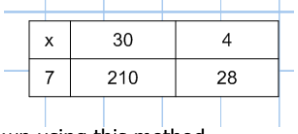
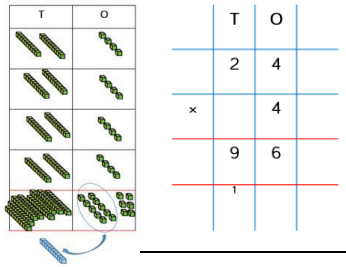
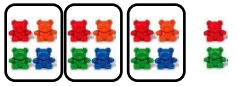
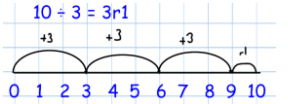
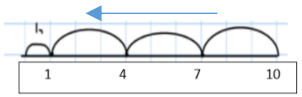
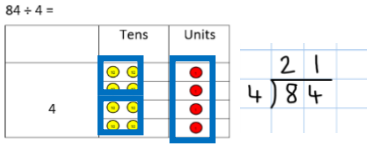
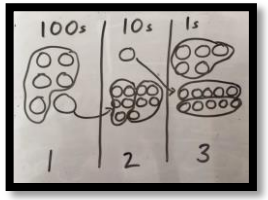
The links between subtraction, addition, division and multiplication are constantly reinforced throughout all year groups. These are particularly relevant when looking at the number facts. The concept of the inverse operation will really help the children develop the ability to complete mental calculations and the term will be introduced to Year 3. Children will also be encouraged to use this to check their workings out.

Children's understanding of place value is central to all of these calculation processes. Developing an understanding of numeracy, quantity and the number system is of intrinsic importance to the ability to be successful in calculation. Therefore, structured place value apparatus (e.g. base 10) are on the tables when children are working through a new calculation method to help them see this relationship and to develop their understanding of the processes they are working through. This will provide visual images and models of the numbers and allow children to develop a strong sense of numeracy.

As part of every lesson, emphasis will be made on mathematical vocabulary and children should have access to written vocabulary at all times to ensure they can recognise and spell them as well as use it in their explanations.

Progression in fractions is described beneath the four main operations.

Year	Addition	Subtraction
Y3	**Mental Methods** **Children should have a good understanding of place value.** **Add a 3-digit number and ones mentally** **Add a 3-digit number and tens mentally** **Add a 3-digit numbers and hundreds mentally**  **e.g. start with the number 146…** **"What is 10 more?.. 100 more?"** **Written Methods** **Add numbers with up to 3-digits**  **They should partition the numbers and then add the units first, then the tens and hundreds etc before adding together to make the total.** **Children need to understand place value and what they are adding in each column e.g. the 7 and 8 are 7 tens add 8 tens.**  **Move to the compact column addition method, with 'exchanging':**   146 + 527 	**Mental Methods** **Subtract mentally a 3-digit number and ones** **Subtract mentally a 3-digit number and tens** **Subtract mentally a 3-digit numbers and hundreds** **Pupils will use counting on as an informal written strategy for subtracting pairs of 2 digit numbers: 58 – 43**  **Written Methods** **Subtracting with 2 and 3 digit numbers (introduce partitioned column subtraction method)**  **Move on to exchanging tens, using apparatus to model, to develop children's understanding.** **Next step – moving on to hundreds, tens and units.**  **Then move to the formal written method ----------→**
	MASTERY - The Big Ideas (NCETM) Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. E.g. 8 + 7, thinking of 7 as 2 + 5, and adding the 2 and 8 to make 10, then the 5 to 15. This should then be applied when calculating with larger numbers. Subtraction bonds can be thought of in terms of addition: for example, in answering 15 – 8, thinking what needs to be added to 8 to make 15. Counting on for subtraction is a useful strategy that can also be applied to larger numbers. **What do you notice?** **Is there a relationship between the calculations?** **500 + 400 = / 523 + 400 = / 523 + 28 =** **400 + 500 = / 423 + 500 = / 423 + 28 =** **300 + 600 = / 323 + 600 = / 323 + 28 =** **200 + 700 = / 223 + 700 = / 223 + 28 =** **100 + 800 = / 123 + 800 = / 123 + 48 =**  **Write the four number facts that this bar model shows.**	**Vocabulary** hundreds, boundary, increase, vertical, , expanded, compact exchange, 'carry', decrease, hundreds, value, digits partition, Calculation, Calculate Addition, Subtraction, Sum, Total Difference, Minus, Less Column addition, Column subtraction Operation Estimate Inverse Operation

Year	Multiplication	Division
Y3	**Mental Methods** Recall and use multiplication facts for the 2, 3, 4, 5, 8 and 10 times tables, and multiply multiples of 10. e.g. 4 x 8 = • Either start with 4 → double it (8), double it(16) , double it(32) • Or start with 8 → double it(16) , double it(32) Develop fluency in mental strategies using the commutative law e.g. 3 x 11 x 5 = 5 x 11 x 3 = 55 x 3 and the distributive law e.g. 15 x 2 = 10 x 2 + 5 x 2 Develop fluent mental methods to solve a range of problems  **Written Methods** **i. Multiply 2-digits by a single digit number** develop understanding of use of arrays  **ii. Introduce the grid method for multiplying 2-digit by single – digits: e.g. 34 x 7** Children should be confident in partitioning as well as multiplication knowledge.  Note: They may make errors with the multiplying aspect, although be fine adding the amounts together, which is easily shown using this method. 210 + 28 = 238 (Children to use an appropriate method for the addition) **iii. Introduce the formal written method for multiplying 2-digit by single – digits: e.g. 24 x 4** 	**Mental Methods** Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 times tables, (through halving connect the 2, 4 and 8 tables) e.g. 32÷4 = Start with 32 → halve it(16), halve it(8) Develop efficient mental methods e.g. using multiplication and division facts to derive related facts **Written Methods** Divide 2-digit numbers by a single digit – where there is no remainder in the final answer, then with remainders.  Model **grouping** on a number line: i. As repeated addition [counting on]  ii. As repeated subtraction [counting back]  10 ÷ 3 = This can also be done vertically – beginning 'chunking' 10 - 3 7 - 3 4 - 3 1 **Short Division** When introducing - limit numbers to no exchanges… then with exchanges. Model division as grouping with PV discs.   123 5 6 1 5 (only with 2-digits not 3 as modelled)

MASTERY - The Big Ideas (NCETM)

It is important for children not just to be able to chant their multiplication tables but also to understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×).
They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.

What do you notice about the following calculations?

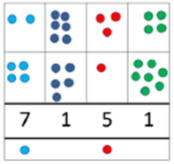
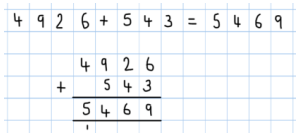
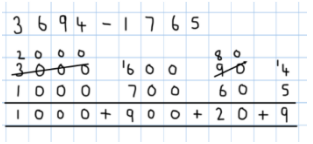
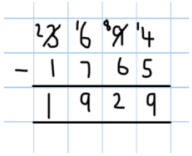
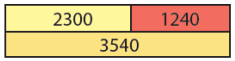
3×4 3×8
4×4 4×8
3×5 3×10

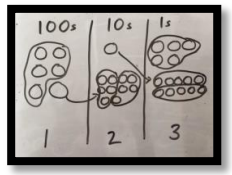
What is 3×4?
What is 13×4?

Asking 'How did you get that?' can help you decide whether children are working efficiently with questions like 13×4 by, for example, calculating 10×4 and adding 3×4, and that 3×4 is not obtained by counting in 1s.

Vocabulary

exchange, decrease, hundreds, value, digits
partition, grid method, multiple, product, tens, units, value
inverse, short division, 'carry', remainder, multiples
Multiplication table, Times table
Multiply, Multiplication, Times, Product
Divide, Division
Inverse
Operation, Estimate

Year	Addition	Subtraction
Y4	**Mental Methods** Continue to practise a wide range of mental addition strategies e.g. number bonds, adding to the nearest multiple of 10, 100, 1000 using near doubles, adjusting and partitioning and recombining. Estimate and check solutions using mental strategies. e.g. 4926 + 543 = Calculations should be presented as horizontal number sentences (to promote mental strategies). **Written Methods** Add numbers with up to 4 digits. When setting out in the vertical format, digits/ columns should be correctly aligned. Children should move from the expanded addition method to the compact column method, adding units first and 'carrying' [exchanging] numbers underneath the calculation.  7 1 5 1  4926 + 543 = 5469 4926 + 543 5469 Make sure children have a clear understanding of place value and understand the importance of this. Pupils should be taught to solve sums including money and measures contexts and add units first, 'carry' [exchanging] numbers underneath the bottom line and reinforce correct place value by reminding them of the actual value of the 'carry'.	**Mental Methods** Find a 1000 less than a given number. Count backwards through 0, including negative numbers Estimate and check solutions using mental strategies. **Written Methods** Subtract with up to 4-digit numbers **Begin with the partitioned method with decomposition.** Knowledge of place value is very important. Children should understand decomposition before moving to the compact method.  3694 - 1765 2000 800 3000 600 90 4 1000 700 60 5 1000 + 900 + 20 + 9 **Move on to compact column subtraction** When setting out in the vertical format, digits/ columns should be correctly aligned.  2 3 6 9 4 - 1 7 6 5 1 9 2 9
	MASTERY - The Big Ideas (NCETM) It helps to round numbers before carrying out a calculation to get a sense of the size of the answer. For example, 4786 – 2135 is close to 5000 – 2000, so the answer will be around 3000. Looking at the numbers in a calculation and their relationship to each other can help make calculating easier. For example, 3012 – 2996. Noticing that the numbers are close to each other might mean this is more easily calculated by thinking about subtraction as difference. Write down the four relationships you can see in the bar model.  2300 1240 3540 Fill in the missing numbers. 352 + ☐ = 480 70 + 99 + ☐ = 270 ☐ – 55 = 84 ☐ – 3000 = 600 Fill in the empty boxes to make the equations correct. 7 ☐ 1 + ☐ 3 ☐ = 999 7 ☐ 1 + ☐ 3 ☐ = 1000	**Vocabulary** thousands, hundreds, digits, inverse Addition, Subtraction Sum, Total Difference, Minus, Less Column addition, Column subtraction Exchange Operation Estimate

Year	Multiplication	Division
Y4	**Mental Methods** Count on in multiples of 6,7,9, 25 and 1000 Recall multiplication facts for all multiplication tables up to 12 x 12 Use place value, known facts and derived facts to multiply mentally fluently Approximate before they calculate and make this a regular part of their calculating. **Written Methods** Multiply 2 and 3-digits by a single digit, using all multiplication tables up to 12x12 **Developing the grid method** **i. TU x U =** x | 30 | 4 7 | 210 | 28 210 + 28 238 **ii. HTU x U =** x | 100 | 40 | 7 6 | 600 | 240 | 420 600 200 +420 1220 [Note: This method shows clearly where errors may occur. The procedure may be correct, but their multiplication or addition skills may be a problem, if the answer is incorrect.] Pupils could be asked to work out a given calculation using the grid, and then compare it to the teacher's column method. Discuss what the similarities and differences are. Go through the steps and use as success criteria.	**Mental Methods** Count back in multiples of 6, 7, 9, 25 and 1000 [from any given number]. Recall multiplication and division facts for all multiplication tables up to 12 x 12 Use known facts to support new facts… e.g. 7 x can be calculated by adding 5 x and 2 x 7 x 8 = 5 x 8 + 2 x 8 **Written Methods** Divide up to 3-digit numbers by a single digit (without exchanges to begin with) **'Chunking'** can be used to model alongside efficient methods. 2 14 54 94 94 ÷ 4 = 94 (10x) -40 54 (10x) -40 14 (3x) -12 2 Answer 23 r 2 Continue to develop **short division** Make sure children are confident with this method before moving on to larger numl 4) 7 3 6 → 19 3) 7 1 4 2 1 → 247 8) 7 7 4 3 4 → 0 9 3  5) 6 1 5 → 123 Children should be taught that a 0 is used to keep place value, if the number is not divisible. **Children to be encouraged to fluently use repeated addition to create a list of solutions for 1 x → 10x of the divisor** [to be used as a 'ready reckoner' of x facts]**.** **e.g. 744 ÷ 8 = …writing '8, 16, 24, 32, 40, 48, 56, 64, 72, 80'**

MASTERY - The Big Ideas (NCETM)

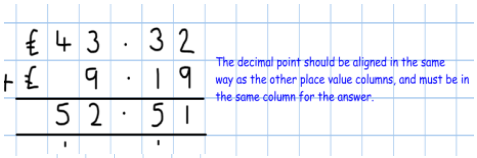
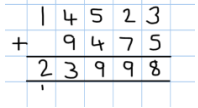
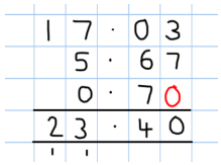
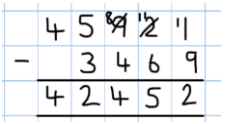
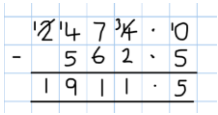
It is important for children not just to be able to chant their multiplication tables but to understand what the facts in them mean, to be able to use these facts to figure out others and to use them in problems.
It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means and see division as both grouping and sharing, and to see division as the inverse of multiplication.
The distributive law can be used to partition numbers in different ways to create equivalent calculations. For example, 4 × 27 = 4 × (25 + 2) = (4 × 25) + (4 × 2) = 108.
Looking for equivalent calculations can make calculating easier. For example, 98 × 5 is equivalent to 98 × 10 ÷ 2 or to (100 × 5) – (2 × 5). The array model can help show equivalences.

Use your knowledge of multiplication tables to complete these calculations.

7 × 6 =	12 × 6 =
7 × 2 × 3 =	13 × 6 =
8 × 7 =	12 × 12 =
2 × 4 × 7 =	12 × 13 =
2 × 2 × 2 × 7 =	12 × 0 =

Which calculations have the same answer? Can you explain why?

Vocabulary
digits, inverse
exchange
inverse, divisible by, factor
Place value
Multiply, Multiplication, Times, Product
Divide, Division
Tenth, hundredth,
Factor pairs
Short multiplication
Operation
Estimate

Year	Addition	Subtraction
Y5	**Mental Methods** Add numbers mentally with increasingly larger numbers, using and practising a range of mental strategies i.e. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds [practise for increased fluency]. Estimate and check solutions using mental strategies. All strategies lead to increased fluency. **Written Methods** Add numbers with more than 4 digits (including money, measures and decimals with different numbers of decimal places)  Numbers should exceed 4 digits Moving on to add more than two values   **Pupils should:** Understand the place value of tenths and hundredths and use this to align numbers with different numbers of decimal places. [Example: adding '0' as a place holder]	**Mental Methods** Subtract numbers mentally with increasingly larger numbers **Written Methods** Subtract with at least 4–digit numbers  Children to use compact column subtraction once confident with the partitioned column method. Children to begin subtracting with larger integers before moving on to decimals.  Zero can be added to empty decimal places (up to 2 dp) to aid understanding of what to subtract in that column. **Pupils should:** Be confident in solving subtraction calculations in a range of contexts, including money and measures.

MASTERY - The Big Ideas (NCETM)

Before starting any calculation is it helpful to think about whether or not you are confident that you can do it mentally. For example, 3689 + 4998 may be done mentally, but 3689 + 4756 may require paper and pencil. Carrying out an equivalent calculation might be easier than carrying out the given calculation. For example 3682 – 2996 is equivalent to 3686 – 3000 (constant difference).

Set out and solve these calculations using a column method.

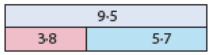
3254 + ☐ = 7999

2431 = ☐ – 3456

6373 – ☐ = 3581

6719 = ☐ – 4562

Write four number facts that this bar diagram shows.



Captain Conjecture says, 'When working with whole numbers, if you add two 2-digit numbers together the answer cannot be a 4-digit number.'

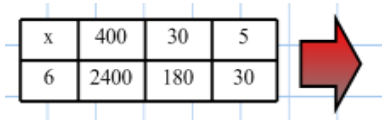
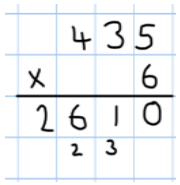
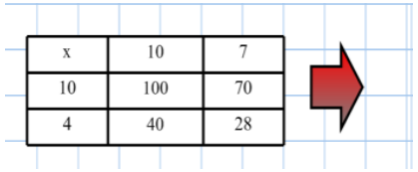
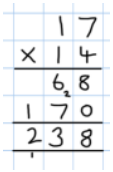
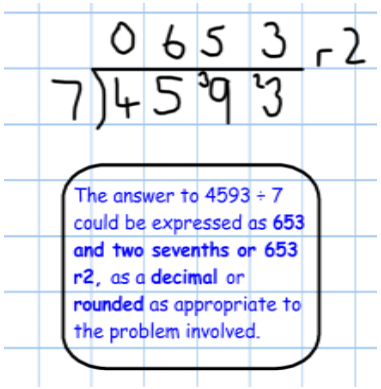
Do you agree?

Explain your reasoning.

Vocabulary

Addition, Subtraction
Sum, Total
Difference, Minus, Less
Column addition, Column subtraction
Exchange
Operation
Estimate

decimal places, decimal points, tenths, hundredths and thousandths

Year	Multiplication	Division
Y5	**Mental Methods** Identify multiples, factors, square, cube and prime numbers, using knowledge of multiplication tables to 12 x 12 Use place value understanding to derive new facts e.g. 4 x 6 = 24 40 x 6 = 240 400 x 6 = 2400 4000 x 6 = 2400 40 x 60 = 2400 400 x 60 = 24000 **Written Methods** Multiply up to 4-digits by 1 or 2 digits Short multiplication for multiplying by a single digit   Explaining multiplying by multiples of 10 and 100 above: **"6 x '4 hundreds' = 24 hundreds" AND/ OR "6 x 4 x 100 = 2400"** **"6 x 3 tens = 18 tens" "6 x 3 x 10 = 180"** Introduce long multiplication for multiplying by 2 digits   Part solutions could be shown 32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 …moving on to more complex numbers up to 4-digit x 2-digit.	**Mental Methods** Recall multiplication and division facts for all numbers to 12 x 12 Divide numbers mentally, using known facts **Written Methods** Divide up to 3 digits by a single digit, without remainders initially **[As Year 4, create 'ready reckoner' for divisor: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70]**  Short division with remainders: Where there is a remainder pupils should then work on real life problem solving context questions, so they understand what the remainder relates to. Then once understood children can move on to expressing the remainder as a fraction, decimal or as a rounded number. Chunking methods from previous year groups can be still be used to support children's progression to more efficient methods.

MASTERY - The Big Ideas (NCETM)

Pupils have a firm understanding of what multiplication and division mean and have a range of strategies for dealing with large numbers, including both mental and standard written methods. They see the idea of factors, multiples and prime numbers as connected and not separate ideas to learn.
They recognise how to use their skills of multiplying and dividing in new problem solving situations.
Fractions and division are connected ideas: 36 ÷ 18 = 36/18 = 2; 18/36 = ½
Factors and multiples are connected ideas: 48 is a multiple of 6 and 6 is a factor of 48.

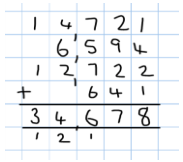
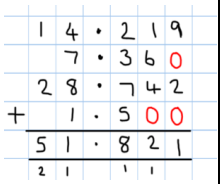
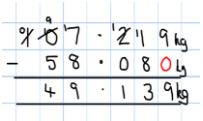
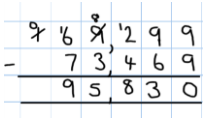
Fill in the missing numbers:

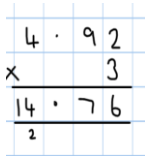
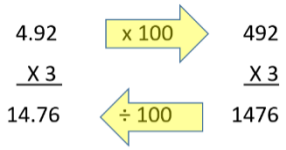
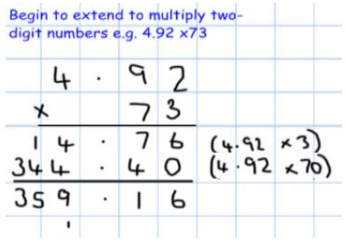
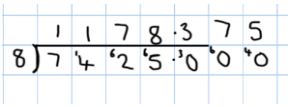
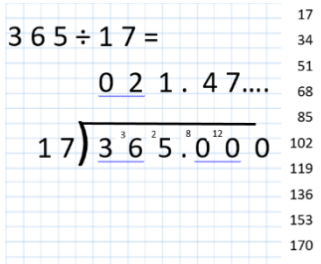
8 ÷ 2 = ☐ ÷ 4 = 32 ÷ ☐ = 64 ÷ ☐

8 is a multiple of 4 and a factor of 16
6 is a multiple of 3 and a factor of ☐
☐ is a multiple of 5 and a factor of ☐
☐ is a multiple of ☐ and a factor of ☐

Vocabulary

decimal places, decimal point, tenths, hundredths and thousandths
square, factor, cube, integer, decimal, short multiplication, long multiplication, exchange ('carry'), quotient, prime number, prime factors, composite number
Multiply, Times, Product
Divide, Division, Divisible
Divisor, Quotient, Estimate, Remainders 'r '

Year	Addition	Subtraction
Y6	**Mental Methods** Perform mental calculations, including mixed operations and large numbers, using and practising a range of mental strategies. Estimate and check solutions using mental strategies. All strategies leading to increased fluency. **Written Methods** **Add several numbers of increasing complexity**  Add several numbers with different numbers of decimal places. Tenths, Hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer. Children can place zeros in empty decimal places, to show 'no value' to add and to aid them with keeping place value of numbers correct.  **Pupils should:** Calculate in context, to include money and measures.	**Mental Methods** Perform mental calculations, including mixed operations and large numbers, using and practising a range of mental strategies. Estimate and check solutions using mental strategies. **Written Methods** Subtracting with increasingly larger and more complex numbers including decimal values up to 3dp.  **Pupils should:** Use the compact column method to subtract more complex integers. Using this method to subtract money and measures as well, including decimals with different numbers of decimal places. Empty decimal places can be filled with zero to show the place value in each column. Pupils should be able to apply their knowledge to select the most appropriate method to work out subtraction problems.  Choose digits to go in the empty boxes to make these number sentences true. 14 781 − 6 ☐ 53 = 8528 23·12 + 22·☐ = 45·23
	MASTERY - The Big Ideas (NCETM) Deciding which calculation method to use is supported by being able to take apart and combine numbers in many ways. E.g. 8·78 + 5·26 might involve calculating 8·75 + 5·25 and then adjusting the answer. The associative rule helps when adding three or more numbers: 367 + 275 + 525 is probably best thought of as 367 + (275 + 525) rather than (367 + 275) + 525. Calculate 36·2 + 19·8 ■ with a formal written column method ■ with a mental method, explaining your reasoning. Two numbers have a difference of 2·38. The smaller number is 3·12. What is the bigger number? Two numbers have a difference of 2·3. They are both less than 10. What could the numbers be?	**Vocabulary** Addition, Subtraction Sum, Total Difference, Minus, Less Column addition Column subtraction Operation Approximate (noun and verb) Estimate (noun and verb) Round Decimal place Check Solution, Answer Order of magnitude Accurate, Accuracy

Year	Multiplication	Division
Y6	**Mental Methods** Recall multiplication facts for all times tables up to 12 x 12. Derive new facts appropriate to for the given calculation. E.g. Example below 0.02 x 3 = 0.06 using 2 x 3 = 6 0.9 x 3 = 2.7 using 9 x 3 = 27 **Written Methods** Short and long multiplication as in Y5, and multiply decimals with up to 2 decimal places by a single digit. When recording, decimal points should be aligned. **Estimate first** 5 x 3 = 15…  Alternately:   Example: Multiply 0.25 by 0.2 start with: **0.25 × 0.2** multiply without decimal points: **25 × 2 = 50** 0.25 has **2** decimal places, and 0.2 has **1** decimal place, so the answer has **3** decimal places: **0.050** **Children should be able to:** Use rounding and place value to estimate answers before calculating and use to check their answers.	**Mental Methods** Recall division facts for all times tables up to 12 x 12. **Written Methods** Divide at least 4 digits by both single-digit and two-digit numbers (including decimals up to 2dps and quantities) Short division, for dividing by a single digit: **'Ready Reckoner': 8, 16, 24, 32, 40, 48, 56, 64, 72, 80**  Short division, for dividing by a 2-digit number: Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number 4 7 6 r 5 12 ⟌ 5 7 9 1 7 Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers 3 6 4 (9 × 1) 27 ⟌ 9 8 3 7 (27 × 3) 8 1 - (300 x 27) 1 7 3 - 1 6 2 (60 x 27) 1 1 7 - 1 0 8 (4 x 27) 9  **Refine accuracy of solutions:** Any 'remainders' should be shown as fractions, and extended to decimals

MASTERY - The Big Ideas (NCETM)

Standard written algorithms use the conceptual structures of the mathematics to produce efficient methods of calculation.
Standard written multiplication method involves a number of partial products. For example, 36 × 24 is made up of four partial products 30 × 20, 30 × 4, 6 × 20, 6 × 4.
There are connections between factors, multiples and prime numbers and between fractions, division and ratios.

It is correct that 273 × 32 = 8736. Use this fact to work out:

- 27·3 × 3·2
- 2·73 × 32 000
- 873·6 ÷ 0·32
- 87·36 ÷ 27·3
- 8736 ÷ 16
- 4368 ÷ 1·6

All the pupils in a school were asked to choose between an adventure park and the seaside for a school trip.

They voted, and the result was a ratio of 5:3 in favour of the adventure park.

125 children voted in favour of going to the adventure park.

How many children voted in favour of going to the seaside?

Vocabulary

extending multiplication with tenths, hundredths and decimals
Common factor
Divide, Division, Divisible
Divisor, Dividend, Quotient, Remainder
Factor

FRACTIONS

Year 3	Begin to add like fractions e.g. 3/8 + 1/8 + 1/8 Recognise fractions that add to 1 e.g. 1/4 + 3/4 e.g. 3/5 + 2/5 Begin to subtract like fractions e.g. *7/8 – 3/8*
Year 4	Add like fractions using the Singapore method to support this; Add like fractions using the Singapore method to support this; Be confident with fractions that add to 1 and fraction complements to 1 e.g. 2/3 + _ = 1 Subtract like fractions :e.g. *4/5 – 3/5 = 1/5* Use fractions that add to 1 to find fraction complements to 1 e.g. *1 – 2/3 = 1/3*
Year 5	Begin to add related fractions using equivalences e.g. 1/2 + 1/6 = 3/6 + 1/6 Begin to subtract related fractions using equivalences e.g. 1/2 – *1/6 = 3/6 - 16 = 2/6* Find simple percentages of amounts e.g. *10%, 5%, 20%, 15% and 50%* Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 e.g. *4 × 2/3 = 8/3 = 2 2/3* Find non-unit fractions of large amounts $\frac{5}{12}$ of 84 = $\frac{84 \times 5}{12} = \frac{420}{12} = 35$ or 84 ÷ 12 = 7 7 x 5 = 35 Turn improper fractions into mixed numbers and vice versa $\frac{20}{3} = 20 \div 3 = 6\ 2/3$ $3\frac{2}{5} = 3 + \frac{2}{5} = \frac{15}{5} + \frac{2}{5} = \frac{17}{5}$

1/5	1/5	1/5	1/5	1/5
1/5	1/5	1/5	1/5	1/5

Year 6

Add mixed numbers and fractions with different denominators

$3\frac{2}{3} + 1\frac{4}{5} = 4\frac{10+12}{15} = 4\frac{22}{15} = 5\frac{7}{15}$

Subtract mixed numbers and fractions with different denominators

$5\frac{3}{8} - 3\frac{5}{6} = 2\frac{9-20}{24} = 1\frac{33-20}{24} = 1\frac{13}{24}$

Multiply fractions and mixed numbers by whole numbers

$6 \times \frac{2}{5} = \frac{12}{5} = 2\frac{2}{5}$ $\quad 2\frac{1}{4} \times 5 = \frac{9}{4} \times \frac{5}{1} = \frac{45}{4} = 11\frac{1}{4}$

Multiply fractions by proper fractions

$\frac{3}{4} \times \frac{8}{9} = \frac{24}{36} = \frac{2}{3}$ or $1\frac{\cancel{3}}{\cancel{4}} \times \frac{\cancel{8}}{\cancel{9}}\,2 = \frac{2}{3}$

Use percentages for comparison and calculate simple percentages

1) Keep me
2) Change me
3) Flip me