Maryland Primary School

Calculation Policy

Review date: July 2013

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Introduction

This document outlines the expectations (based on the new curriculum plus the needs Maryland pupils) of written and mental strategies for each year group in the primary setting and it should be referred to by all maths teachers (including support staff). The document is progressive and although the document is specific regarding the expectations for each individual year group, teacher assessment should also be used (i.e. the teacher may see fit to look at the year above or below depending on the ability of the pupils that they teach).

Key points for teaching

Mental calculation

- In the sections identifying mental calculation there are examples to help you set the pitch of the work. The examples for + and - in the rounded brackets ( ) provide cases where the calculation involved does not cross any boundary – do not include these brackets when modelling/teaching pupils. The examples in the squared brackets [ ] provide examples which involve some crossing of a boundary (bridging) or are somehow more difficult. When introducing the calculation to pupils for the first time focus on examples that do not involve any crossing of boundary to establish the place value of the numbers before moving on to those that require bridging.
- For each year group the statements identify what is new to that year group. However it is essential that children continue to practise what they have been taught in the previous year alongside the new content and skills.
- At any age, when children are first introduced to a new mental strategy, larger numbers or new concepts they may need access to practical equipment or pictures to help them to understand the structures and procedures involved. Over time, gradually limit and remove the resources and encourage children to use their visualisation skills, drawing on images to aid development of their mental skills.
- While the overall aim is to develop children's ability to calculate in their heads, at various times they may still need to make jottings and diagrams to help them, for example make a sketch of an empty number line to aid partitioning and bridging, or an array to help with early multiplication and division. Children should become better at holding information in their heads but at times there may be too much for them and a quick jotting can help aid memory.
- Children will need to be able to apply their mental calculation strategies to numbers that are set in a context. Provide your children with different contexts for the numbers that help them become better at solving problems. Use examples such as measures, money,

time, angle in a real-life context that children will recognise and understand. Problems should include those where X objects are connected to Y objects. For example, 3 cakes shared equally between 10 children? [year 5]

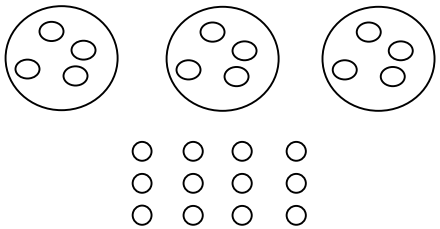
Written calculation

- For each year group the statements identify what written method is to be taught. However, it is up to the teacher to assess the children in their class and pitch the methods correctly. For example, a low achieving year 4 pupil may not be ready to use the method stated in the year 4 section of this policy, therefore reference can be made to the year 3 section to see if this is more suitable. Similarly, a high achieving year 4 pupil may be ready to move on to the year 5 method, as long as the year 4 method is secure.
- Note that 'carrying' is recorded underneath and 'borrowing' on top, this is to provide the pupils with a clear distinction between the two processes
- Teachers should emphasise the importance of presentation when carrying out written methods and highlight the mistakes that can be made when there is poor presentation. 1 digit should be in each square and written sentences (literacy) should flow across the horizontal lines disregarding the squares (not 1 letter in each box).
- Place value should be reinforced across the methods using 'place value houses' (column headings) stated below:

$$\text{Th}\ \ \text{H}\ \ \text{T}\ \ \text{U}\ .\ \frac{}{10}\ \ \frac{}{100}$$

- Children will need to be able to apply their written calculation methods to numbers that are set in a context. Provide your children with different contexts for the numbers that help them become better at solving problems. Use examples such as measures, money, time, angle in a real-life context that children will recognise and understand. Problems should include those where X objects are connected to Y objects. For example, 3 shirts and 4 shorts how many different outfits? [year 3]
- The definition of 'long and short multiplication/division' should be clear and consistent throughout KS2. In the instance of 'short multiplication', this occurs when any number is multiplied by a known times table (x1 – x12), therefore 'long multiplication' will be any number multiplied by an unknown times table (x13 and above) as the latter will require more extensive working out and is a 'longer' calculation.

Year 1

Addition and Subtraction	**Multiplication and Division**
By the end of the year children should be able to: • **Generate represent and recall** number bonds for pairs of single digit numbers and represent and use these number bonds to derive related subtraction facts (7 + 2 = 9, 9 - 2 = 7, 9 – 7 = 2) • **Calculate mentally** -given a number, identify one more one less -count in 1's, 2's, 5's and 10's • **Calculate using written methods** **-**read, write and interpret number sentences that involve addition (+), subtraction (-) and equals (=) -add and subtract one-digit and teens numbers (3 + 11; 18 – 6) [8 + 13, 17 – 9]	By the end of the year children should be able to: • **Relate** the counting in 2's, 5's and 10's to groups of objects and pictoral representations including arrays • **Recognise** that by grouping objects in <u>sets of</u> 2, 5 or 10 they can count the objects in 2s, 5s or 10s • **Use the language** of multiplication to describe totals for objects arranged into groups - objects arranged in three groups five, say "5 multiplied by 3" and for an array with 10 rows and 6 columns say "10 multiplied by 6" • **Use the language of division to describe ('sharing' 'grouping')** • **Calculate using written methods** Represent solutions to problems involving multiplication and division using practical resources, pictures or arrays. *Eg. There are 4 biscuits on each of the 3 plates, how many biscuits are there altogether?* 
Notes: - When teaching addition and subtraction practically introduce children to the notation so that they recognise and use the symbols for addition (+), subtraction (-) and equals (=) - Teach children that the equals sign (=) means that the numbers either side of it have the same value and it does not mean 'makes' or 'the	**Notes:** - When introducing the concept of multiplication and division focus on the grouping of objects and the associated language - Children need **not** be introduced to the notation/symbol of multiplication (X) and division (÷) at this stage

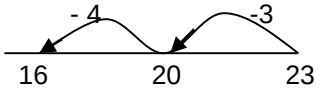
answer is'. Use of a balance provides a strong visual image - Teach children that they can add and subtract zero to and from a number and show them how this can be recorded - Teach children how to find the numbers that are missing from a number sentence (? + 3 = 12, 12 - ? = 7) [? + 6 = 15, 14 - ? = 8]	

Year 2

Addition and Subtraction

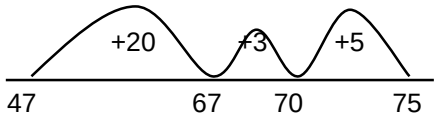
By the end of the year children should be able to:

- **Recall** fluently + and – facts to 20 and use these facts to generate and derive related facts up to 100 [3 + 9 = 12, 30 + 90 = 120, 120 – 90 = 30]
- **Calculate mentally**
  - U ± U (4 + 3; 2 + 7) [6 + 5; 9 – 6]
  - U ± U ± U (2 + 3 + 2; 5 + 1 - 3) [3 + 4 + 7; 8 – 3 + 7; 9 – 2 – 5]
  - T ± T (30 + 40; 70 - 20) [80 + 50; 70 – 40]
  - TU ± U (46 + 3; 78 – 6) [34 + 8; 23 – 7]
  - U + TU (6 + 83) [7 + 24]
  - TU ± T (54 + 40; 86 – 50) [45 + 60; 74 – 50]
  - T + TU (60 + 33) [70 + 48]
  - TU ± TU (37 + 21; 65 – 23) [34 + 48; 88 – 19]
  - Find missing number in addition and subtraction number sentences
  - Use partitioning when subtracting eg. for 23 - 7 write 23 – {3 - 4} 7

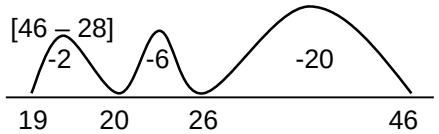


- **Calculate using written methods**
  - TU ± TU
  - Using the empty number line

[28 + 47 = 47 + 28]



[46 – 28]



Using the column method

(34 + 23)

T	U
3	4
+ 2	3
5	7

(68 – 35)

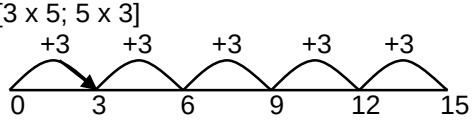
T	U
6	8
- 3	5
3	3

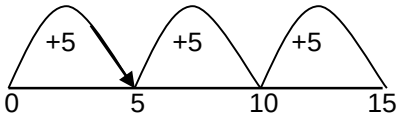
Multiplication and Division

By the end of the year children should be able to:

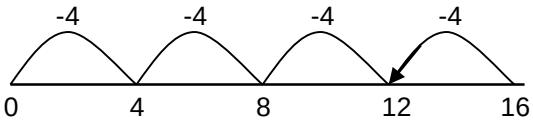
- **Count** in 2s, 5s and 10s and use this to derive multiplication facts and to count groups when dividing
- **Calculate mentally**
  - Double to 10 [9 + 9; double 6]
  - Double tens [20 + 20; double 60]
  - Derive halves form the double [halve 8; half of 120]
  - Relate doubling to multiplying by 2 [double 6 is the same as 2 x 6]
  - Recall multiplication facts for 2, 5 and 10 times tables
  - Derive division facts from the 2, 5 and 10 times tables
  - Find missing number in multiplication and halving number sentences
- **Calculate using written methods**
  - U x U; T x U; U x T
  - U ÷ U; [5 x 8; 8 x 5]
  - TU ÷ U [20 ÷ 5]
  - Numbers used should relate to the 2, 5 and 10 times tables

[3 x 5; 5 x 3]





[16 ÷ 4]



Notes:

- When adding, encourage children to start from the larger number and understand when and why this helps.
- Teach children how to bridge through the multiples of 10
- When subtracting, help children to recognise when to partition into T and U, into T and teens to model decomposition
- Children should be able to demonstrate that the addition of two numbers can be done in any order but not for subtraction
- Teach children to recognise and use the inverse relationship between + and -
- Teach children to use the number line to count on or up when adding and

Notes:

- Introduce children to the notation/symbol of multiplication (X), division (÷) and equals (=) sign to generate and record number sentences
- Teach children to use repeated addition for multiplication and model this on the number line using counting on or up
- Use arrays and number lines to show that multiplication is commutative
- Build on the idea of equal sharing to establish that division involves generating and making groups of equal sizes
- Teach children to use repeated subtraction when dividing and model this on the number line using counting back/down
- Teach children to recognise and use the inverse relationship between X

to count back or down when subtracting - Once children are secure with + and – using empty number lines introduce column methods of recording where carrying and borrowing are not required - Teach children that adding and subtracting zero leaves the number unchanged - *The number sentence being calculated should be recorded alongside the working out* - *Emphasise that once the answer has been calculated it needs to be written next to the original number sentence*	and ÷ - Develop the idea of inverse operations as doing and undoing - Show that X can be done in any order whereas division cannot - *The number sentence being calculated should be recorded alongside the working out* - *Emphasise that once the answer has been calculated it needs to be written next to the original number sentence*

Year 3

Addition and Subtraction

By the end of the year children should be able to:

- **Recall** fluently and rapidly + and – facts to 20, and corresponding facts for multiples of T and H [300 + 900 = 1200; 150 - 80 = 70]
- **Calculate mentally**
  - HTU ± U (523 + 5;377 – 6) [324 + 7; 672 - 9]
  - U + HTU (7 + 561) [8 + 248]
  - HTU ± T (543 + 50; 876 – 50) [783 + 50; 246 – 70]
  - T + HTU (40 + 627) [80 + 567]
  - HTU ± H (439 + 600; 952 – 700) [839 + 600; 952 – 700]
  - H + HTU (300 + 479) [700 + 579]
  - T ± T ± T (30 + 40 + 20; 40 + 50 – 30; 80 – 30 + 10; 90 – 20 – 50) [30 + 40 + 70; 40 + 60 – 30; 80 – 20 + 70; 90 – 20 – 50]
  - Find missing number in addition and subtraction number sentences

- **Calculate using written methods** for calculations involving carrying and borrowing . Children use the expanded method as an introduction to column methods to help them understand the concept of carrying and borrowing. In the case of addition, the calculation should only involve carrying of the T or H not both [eg: 457 + 372] In the case of subtraction, the calculation should only involve decomposition of the T or H not both
  - TU ± TU
  - HTU ± TU
  - HTU ± HTU

    [638 + 291; 543 – 219]

Expanded

H	T	U	
600	+ 30	+ 8	
+ 200	+ 90	+ 1	
900	+ 20	+ 9	=929
100			

Compact

H	T	U
6	3	8
+ 2	9	1
9	2	9
1		

H	T30	U	
500	+ 40	+ 13	
- 200	+ 10	+ 9	
300	+ 20	+ 4	=324

H	T3	U
5	4	13
- 2	1	9
3	2	4

Multiplication and Division

By the end of the year children should be able to:

- **Count** in 4s, 8s, 50s and 100s from 0
- **Calculate mentally**
  - Recall multiplication facts for 3, 4 and 8 times tables
  - Derive division facts from the 3, 4 and 8 times tables
  - Find missing number in multiplication and division number sentences
  - U x T [6 x 10;9 x 10] describe the effect using place value houses
  - T x U [10 x 7;10 x 5] describe the effect using place value
  - TU x U by partitioning and jottings [23 x 4; 53 x 8]
  - U x TU by partitioning and jottings [8 x 12; 5 x 74]

- **Calculate using written methods**
  - TU x U ; U x TU [26 x 3; 3 x 26]
  - TU ÷ U [74 ÷ 4]
  - Numbers used should relate to the 3, 4 and 8 times tables

Partition into T and U, create 2 simpler number sentences, recombine

[37 x 4; 4 x 37] 37 x 4 = 120 + 28 = 148

30 7

7 x 4 = 28
30 x 4 = 120
37 x 4 = 148

Short multiplication (TU X U)

```
  37
x  4
 148
  2
```

Short division (bus stop method) with remainders

[64 ÷ 3]

```
    21 r1
3 ) 64
```

Notes: - When teaching written methods note that the carrying of the T or H is recorded *underneath* the calculation and decomposition is recorded *on top.* This helps the children distinguish between the two processes. - Whilst using the expanded method for subtraction emphasise that the + signs are to show how that number has been partitioned - When adding/subtracting, encourage children to first estimate the answer and explain how they arrived at that estimation (eg: use of rounding) - Teach children to use the commutative rule when adding and the inverse to check their answers - Teach children how to find 10/100 more or less than a given number (up to at least 1000) [10 + 968; 1000 – 100] - The mental calculations build on those taught in year 2. Ensure that children continue to practise those calculations identified in the previous year group. - When modelling these written strategies always show both methods alongside each other until expanded method is no longer needed – this should typically be a brief period of time.	**Notes:** - When 'initially' teaching mental/written methods for TU x U, ensure the numbers involved use times tables facts already taught (eg. 23 x 4 relies on knowledge of 2, 3 and 4 times tables) - Model correct presentation/layout of X written method so that when recombining/adding totals, numbers are set out in columnar fashion (reinforces column addition) - Once partitioning for X is secure, move on to short multiplication of TU X U only, if unsecure pupils can remain using partitioning - For division, introduce bus stop method by dividing TU/HTU by U - emphasise the point that this strategy is more efficient - When introducing the bus stop method (short division), allow children to first *become confident* with calculations where **no remainders** are involved. Remainders should be taught with bus stop method by the end of the year and recorded with the letter 'r' (decimal notation in yr5) - Carrying should be introduced within bus stop method, this should occur only once within the same calculation

Year 4

Addition and Subtraction

By the end of the year children should be able to:

- **Recall** instantly + and – facts to 20, and corresponding facts for multiples of T, H and Th [3000 + 9000 = 12000; 1500 - 800 = 700]
- **Calculate mentally**
  - TU ± TU (32 + 17; 46 + 42; 38 – 26; 92 – 21) [35 + 17; 46 + 29; 35 – 26; 72 - 39]
  - Th ± Th (5000 + 3000; 9000 – 4000) [8000 + 6000; 13000 – 5000]
  - Th ± H (3000 + 600; 1000 – 600) [12000 + 600; 12000 – 600]
  - H + Th (400 + 2000) [400 + 15000]
  - H ± H ± H (300 + 200 + 400; 400 + 500 – 300; 800 – 400 + 500; 900– 200 – 500) [300 + 400 + 700; 400 + 600 – 300; 800 – 300 + 700; 900 – 200 – 500]
  - 0.t ± 0.t (0.4 + 0.3; 0.6 – 0.1) [0.8 + 0.7; 0.9 – 0.1]
  - U ± U.t [3 + 1.7; 2 – 1.0] [3 + 6.9; 2 – 1.4]
  - Find missing number in addition and subtraction number sentences

- **Calculate using written methods** for calculations involving carrying/converting and borrowing/exchanging on up to two occasions within any calculation [eg: 4302 – 174]
  ThHTU ± TU
  ThHTU ± HTU
  ThHTU ± ThHTU

Borrowing on two occasions

6738 – 874 =

	Th	H	T	U
	5	16		
	~~6~~	~~7~~	13	8
-		8	7	4
	5	8	6	4

Carrying on two occasions

6738 + 1291 =

	Th	H	T	U
	6	7	3	8
+	1	2	9	1
	8	0	2	9
	1	1		

Multiplication and Division

By the end of the year children should be able to:

- **Count** in 6s, 7s, 9s, 25s and 1000s from 0
- **Calculate mentally**
  - Recall multiplication facts from 12 x 12 times tables
  - Derive division facts from the 12 x 12 times tables
  - T x U; H x U [60 x 3; 400 x7]
  - Find missing number in multiplication and division number sentences
  - TU x U by partitioning and distributive law, jotting steps
    23 x 4 = 20 x 4 + 3 x 4 = 80 + 12 = 92
  - U x U x U [4 x 6 x 5]
  - Multiply up to 3 digit numbers by 10, 2 digit by 100 and describe the effect using place value houses[21x10;10 x 434] [25x100;68x100]
  - Divide multiples of T, H, Th by 10/100 and describe the effect using place value houses [70 ÷ 10; 4000 ÷ 100]
- **Calculate using written methods**
  - TU x U; U x TU [62 x 4; 4 x 62]
  - HTU x U; U x HTU [536 x 4; 4 x 536]
  - HTU ÷ U [684 ÷ 2]

[326 x 7]

Grid method (reinforces place value)

x	7			
6			4	2
20		1	4	0
300	2	1	0	0
	2	2	8	2

Short multiplication - involving one case of carrying (HTUXU)

HTU	
1	26
X	7
8	82
1	4

	Short division (bus stop method) (HTU÷U) – carrying 2 occasions [741 ÷ 3] $3\overline{)714_{2}1}$ (2 4 7)
Notes: - When teaching mental + and – children use the commutative rule to reverse the addition fact - The mental calculations build on those taught in year 3. Ensure that children continue to practise those calculations identified in the previous year group. - Teach children how to find 1000 more or less than a given number (up to at least 9,000) [8679 + 1000; 5863 – 1000]	**Notes:** - Grid method should **only** be used briefly for X of 3 digit numbers if place value is not secure. If place value is secure do not use grid method *move straight onto* expanded multiplication - Note for grid method the 3 digit number is partitioned on the left and the unit is at the top, this is an important presentational feature as it allows the totals to be set out in columnar fashion (reinforces columns addition) and gets the children used to multiplying the units first (will be developed in next year's strategy) - Teach the effect of multiplying any number by 0 and 1 and also dividing by 1. - Carrying can occur twice within the same calculation

Year 5

Addition and Subtraction

By the end of the year children should be able to:

- **Recall** instantly + and – facts to 20, and corresponding facts for multiples of T, H and Th [13000 + 9000 = 22000; 15000 - 8000 = 7000]
- **Calculate mentally**
  - ThH ± ThH (4300 + 2600; 8600 – 3500) [4300 + 2800; 6600 – 3900]
  - ThT ± ThT (7080 + 1010; 7060 – 2040) [4090 + 2050; 8060 – 5080]
  - ThU ± ThU (4006 + 1003; 8007 – 7002) [4007 + 1007; 8003 – 7009]
  - ThHTU ± ThH (8761 + 1200; 12462 – 2300) [9761 + 1300; 18162 – 2300]
  - Th ± Th ± Th (1000 + 2000 + 5000; 4000 + 5000 – 3000; 8000 – 3000 + 2000; 9000 – 2000 – 5000) [3000 + 4000 + 7000; 4000 + 6000 – 3000; 8000 - 3000 + 7000; 9000 – 2000 – 5000]
  - U.$\frac{}{10}$ ± U.$\frac{}{10}$ (4.4 + 5.5; 6.7 – 3.6) [3.2 + 1.9; 4.2 – 1.8]
  - Complements to 1, 1 decimal place [0.8 + 0.2; 1 – 0.6]
  - 0.$\frac{}{10}\frac{}{100}$ ± 0.$\frac{}{10}\frac{}{100}$ (0.35 + 0.22; 0.47 + 0.02; 0.58 + 0.3; 0.86 – 0.34; 0.48 – 0.03; 0.96 – 0.5) [0.35 + 0.28; 0.47 + 0.06; 0.58 + 0.6; 0.82 – 0.34;0.43 – 0.07; 0.96 – 0.5]

- **Calculate using written methods** for calculations involving whole numbers with four or more digits (eg. 26951 + 1536) and decimal numbers with up to 2 decimal places

281.5 – 34.8 =

	H	T	U . $\frac{}{10}$
		7	10
	2	~~8~~	~~1~~ .15
-		3	4 . 8
	2	4	6 . 7

67.38 + 12.91 =

	T	U . $\frac{}{10}$	$\frac{}{100}$
	6	7 . 3	8
+	1	2 . 9	1
	8	0 . 2	9
	1	1	

Multiplication and Division

By the end of the year children should be able to:

- **Count** in 10s, 100s, 1000s, 10,000s, 100,000s from any given number up to 1,000,000
- **Calculate mentally**
  - Recall multiplication facts from 12 x 12 times tables
  - Derive division facts from the 12 x 12 times tables
  - Multiply 1 and 2 place decimals by 10/100 and divide whole numbers by 10/100 and describe the effect using place value houses [45.3 x 100; 10 x 9.35] [56.32 ÷ 100 ; 63.7 ÷10]
  - X and ÷ numbers drawing upon known facts
- **Calculate using written methods**
  - ThHTU x U
  - HTU.$\frac{}{10}$ x U
  - TU.$\frac{}{10}\frac{}{100}$ ÷
  - TU x TU
  - ThHTU ÷ U;
  - HTU.$\frac{}{10}$ ÷ U
  - TU.$\frac{}{10}\frac{}{100}$ ÷ U

[46 x 38]
Expanded multiplication

	T	U
	46	
	x	38
(8 x 6)		48
(8 x 40)	320	
(30X6)	180	
(30X40)	1200	
	1748	

[46 x 38]
Compact multiplication

	TU
	46
x	38
	368 *record carrying
	1380 underneath
	1748

[758.4 x 6]

	H	T	U . $\frac{}{10}$
	7	5	8. 4
x			6
	4	5	5 0 . 4 ***

[8293 ÷ 4]
Short division (bus stop method)

	Th	H	T	U . $\frac{}{10}\frac{}{100}$
	2	0	7	3 . 2 5
4)	8	2	9	3 . 10 20 ****

Notes: - When teaching mental calculations involving the thousands, initially focus on examples where there is no crossing of boundaries before introducing those examples which require bridging/crossing boundaries. - The mental calculations build on those taught in year 4. Ensure that children continue to practise those calculations identified in the previous year group.	**Notes:** - Expanded method should **only** be used briefly for multiplication of TU x TU if place value and the order of multiplication is not secure. If these are secure ***move straight onto*** **compact method** - Children should realise that if they can X and ÷ up to 4 digits, technically they can go beyond using the formal methods taught - If there is a remainder, teach that this is in fact less than a whole number so use of decimal notation is required - Children should solve calculations where carrying is involved in more than one place within the same question (see example above) - When dividing with remainders, teach the children how to calculate the remainder as a decimal (up to 2 decimal places)

Year 6

Addition and Subtraction

By the end of the year children should be able to:

- **Recall** instantly + and – facts to 20, and corresponding facts for multiples of T, H and Th [13000 + 9000 = 22000; 15000 - 8000 = 7000]
- **Calculate mentally**
  - *Pairs of numbers as listed in year 4*
  - ThH ± ThH (4500 + 3200; 6800 – 3100) [8700 + 6400;6500 – 3800]
  - ThT ± ThT (5040 + 3030; 8070 – 4060) [7040 + 1080; 7020 – 2060]
  - ThU ± ThU (7005 + 1003; 9006 – 5004) [4009 + 1008; 8001 – 7002]
  - ThHTU ± ThH (5551 + 3400; 16462 – 4300) [7761 + 1400; 12462 – 4300]
  - ThH ± ThH ± ThH (2500 + 4300 + 1100; 4400 + 5500 – 3300; 8600 – 3200 + 2500; 9900 – 2400 – 5300) [3100 + 4300 + 7200; 4400 + 6500 – 3300; 8600 – 3200 + 7900; 9300 – 2400 – 5300]
  - U.$\frac{}{10}$ ± U.$\frac{}{10}$ (4.5 + 5.3; 2.8 – 1.3) [3.2 + 1.9; 4.2 – 1.8]
  - U.$\frac{}{10}\frac{}{100}$ ± U.$\frac{}{10}\frac{}{100}$ (2.05 + 4.22; 7.7 + 2.06; 2.58 + 3.11 9.84 – 7.03; 4.61 – 1.5; 5.86 – 3.15) [6.45 – 0.07; 3.16 – 1.5; 4.53 – 2.16]
  - Complements to 1, 2 decimal places [0.83 + 0.17; 1 – 0.62]
  - Find missing number in addition and subtraction number sentences
- **Calculate using standard column written methods** for calculations involving large whole numbers and decimal numbers with up to 3 decimal places

Multiplication and Division

By the end of the year children should be able to:

- **Calculate mentally**
  - consolidation of previous year objectives
  - calculations which involve mixed operations and large numbers
  - multiplication of U.$\frac{}{10}$ x U and U.$\frac{}{10}$ x U.$\frac{}{10}$ using times tables knowledge

  eg: 1.2 x 3 or 7 x 0.5 or 0.3 x 0.4

- **Calculate using written methods**
  - ThHTU x TU;
  - HTU.$\frac{}{10}$ x TU;
  - TU.$\frac{}{10}\frac{}{100}$ x TU
  - HTU ÷ TU
  - ThHTU ÷ TU
  - HTU.$\frac{}{10}$ ÷ TU
  - TU.$\frac{}{10}\frac{}{100}$ ÷ TU

Compact multiplication

[22.34 x 43]

Th	H	T	U	
	2	2	3	4
x			4	3
	6	7	0	2
8	9	3	6	0
9	6	0	6	2

***record carrying underneath

Note in the above example .$\frac{}{10}\frac{}{100}$ are not used for place value houses (column headings) even though this calculation does involve tenths and hundreths, Children are taught to count the decimal places they have in the number sentence to recognise how many they will have in the answer.

[672 ÷ 23]

	H	T	U.$\frac{}{10}\frac{}{100}$
	0	2	9.2 1
23)	6	7	2.0 0

***record carrying underneath

• From September, be able to number sentences	use BODMAS to form with multiple operations.
Notes: - When teaching mental calculations involving the Th, use examples where there is no crossing of boundaries (those italicised above) before introducing those examples which require bridging/crossing boundaries. - The mental calculations build on those taught in year 5. Ensure that children continue to practise those calculations identified in the previous year group.	**Notes:** - Yr 6 mental objectives are scarce compared to previous years; this is because for yr6 pupils it is mainly about consolidating previously taught objectives. - Teach rule for X with decimals, having modelled the principle visually. - When teaching ÷ TU, model using known facts in an efficient way (see above). - Teach children rules for multiplying decimals (see example given above).