

Langdon Primary School

Calculation Policy

2021-2022

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| **ADDITION GUIDELINES** |
| **Year One** | **Year Two** | **Year Three** |
| * **Know how to combine 2 sets of objects together by counting them**
* **Know part-part-whole and use this when talking about ‘number sentences’ (first, next, then)**
* **Use part-part-whole to solve empty box questions eg. 8+5=🞏**
* **Know number bonds to 10 including 0**
* **Use number tracks to support counting and addition**
* **Be able to explain and apply**
 | * **Know number bonds to 20**
* **Apply to addition calculations**

**16 + 4 =****37 + 3 =*** **Move from number tracks to number lines**
* **Add a single and a 2-digit number**

**6 + 23 =****23 + 6 =*** **Add two 2-digit numbers**

**21 + 14 =**  **Then…** **62 + 31 = 93** **60 + 30** = 90 **2 + 1** = 3 **90 + 3 = 93*** **Add multiples of ten to each other and to two-digit numbers:**

**40 + 50 =** **54 + 20 =*** **Be able to explain and apply**
 | * **Know number bonds to 100, including ones**

**34 + 66 = 100*** **Add multiples of ten to reach hundreds and to cross the hundreds boundary**

**150 + 50 = 200****137 + 90 = 227*** **Mentally be able to find the difference between the following:**

**HTU – U****HTU – T****HTU – H*** **Use informal written method using partitioning:**

65 + 18 =60 + 10 =70 5 + 8 =1370 + 13 = 83* **Add three digit numbers**
* **Be able to explain and apply**
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| **ADDITION GUIDELINES** |
| **Year Four** | **Year Five** | **Year Six** |
| * **Adapt informal written method from Year 3 to vertical expanded layout**
* **Start with TU + TU then HTU + HTU**

**60 + 5****10 + 8** **70 + 13 = 83*** Use expanded layout to solve money and measures problems
* **Be able to explain and apply**
 | * **Extend informal written methods to column addition of two integers up to 10,000**
* **Use with decimal money, length, weight, capacity**
* **Continue to stress mental and informal strategies of appropriate numbers**
* **Introduce by the end of the year, formal column methods of addition, including bridging the columns by carrying a value forward:**

 **5346****+ 1578** **6924** **1 1*** **Be able to explain and apply**
 | * **Extend use of column addition to decimals and different contexts such as money, length, weight, capacity**
* **Be able to explain and apply**
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| **SUBTRACTION GUIDELINES** |
| **Year One** | **Year Two** | **Year Three** |
| * **Know number bonds to 10 including 0**

**7 – 3 = 4*** **Use part-part-whole to solve empty box problems eg.**

**13 - 🞏 = 7*** **One stop word problems eg.**

**Find the difference between…..** **How much longer is the second stick?****How many must I add to make the 2 sticks the same?**

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* **Be able to explain and apply**
 | * **Subtraction of multiples of ten**

**70 – 30 = 40*** **Subtraction of multiples of ten from a two-digit number**

**34 – 20 =*** **Link addition and subtraction facts, using the inverse operation to check**

**6 + 4 = 10****4 + 6 = 10****10 – 4 = 6** **10 – 6 = 4*** **Use mental strategies to find the difference between the following:**

**TU – U****TU – T*** **Use manipulatives, numbertracks or numberlines to ‘find the difference’ between TU – TU:**

**31 – 26 =**+1 +1 +1 +1 +1 **26 27 28 29 30 31*** **Be able to explain and apply**
 | * **Know number bonds to 100 including ones**

**100 – 34 = 66*** **Mentally be able to find the difference between the following:**

**HTU – U****HTU – T****HTU – H*** **Informal written method using counting on**

**Find the difference between 338 and 63**  **+7 +30 +200 +38**  63 70 100 300 338 **200 + 30 + 30 + 8 + 7** = 275 or **200 + 38 + 30 +7** = 275 * **Introduce column subtraction with no exchange across columns**
* **Use the inverse operation to check**
* **Be able to explain and apply**
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| **SUBTRACTION GUIDELINES** |
| **Year Four** | **Year Five** | **Year Six** |
| * **Mentally be able to find the difference between the following:**

**ThHTU – U****ThHTU – T****ThHTU – H*** **Extend informal written method using counting on – focus on increasing efficiency and problems involving money, measures and time**
* **Be able to explain and apply**
 | * **Mentally be able to find the difference between the following:**

**¹⁰Th Th H T U – U****¹⁰Th Th H T U – T****¹⁰Th Th H T U – H*** **Consolidate informal written method using counting on – focus on increasing efficiency and problems involving whole numbers, decimals, money, measures and time eg.**

 **£30.00 - £12.39 = £17.61** **+ 61p +£7 +£10** £12.39 £13.00 £20.00 £30.00 **£10 + £7 + 61p** = **£17.61** or **£17 + 61p** = **£17.61*** **By the end of the year, column subtraction with exchange across tens/units columns eg.**

H T U 7 19 8 2 -4 5 75 2 5 * **Be able to explain and apply**
 | * **Columnar subtraction with exchange across all columns using numbers to 10 000 000**
* **Columnar subtraction with exchange across all columns including decimals**
* **Be able to explain and apply**
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| **DIVISION GUIDELINES** |
| **Year One** | **Year Two** | **Year Three** |
| * **Using grouping (of concrete apparatus and/or jottings) to solve question such as:**

**I have 8 wheels, how many bikes can I make?****Give everyone 2 sweets****Make groups of 3 for PE****Halving small even numbers** * **Be able to explain and apply**
 | * **Grouping equally into 2s, 3s, 5s and 10s**

**15 ÷ 3 =** * **Put quantities into groups**

**Stress that can be organised in any order****Put 15 into groups of 3:**X X X **3**X X X **6**X X X **9 Link to array**X X X **12**X X X **15**X X X X X  X X X X X X X X X X **3 6 9 12 15*** **Halving as inverse as doubling**
* **Be able to explain and apply**
 | * **Grouping equally into 2s, 3s, 4s, 5s, 6s, 8s and 10s**
* **Informal written method using equal groups on a numberline:**

**Put 24 into groups of 6** +6 +6 +6 +6 0 6 12 18 24 * **Introduce remainders**

 **Put 27 into groups of 6** **27 ÷ 6 = 4 r 3** +6 +6 +6 +6 **xxx**0 6 12 18 24 27 * **Focus on grouping rather than sharing**
* **Halving even numbers as inverse of doubling**
* **Division as the inverse of multiplication**
* **Be able to explain and apply**
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| **DIVISION GUIDELINES** |
| **Year Four** | **Year Five** | **Year Six** |
| * **Grouping equally into 2s, 3s, 4s,**

**5s, 6s, 7s, 8s, 9s and 10s*** **Division facts for multiplication tables up to 12 x 12**
* **Read questions as:**

 **‘Put 136 into groups of 6’** * **Extend informal written method as Yr 3 – increase efficiency by using multiples of 10 as first jump**
* **TU ÷ U / HTU ÷ U**

 **136 ÷ 6 = 22 r 4** **10 x 6 10 x 6 2 x 6 \*\*\*\*****0 60 120 132 136*** **Be able to explain and apply**
 | * **Extend informal written method as Yr 4 – increase efficiency by using multiples of 10 and 100**
* **Read questions as:**

 **‘Put 740 into groups of 6.’** * **TU ÷ U / HTU ÷ U / ThHTU ÷ U**

 **740 ÷ 6 = 123 r 2** **100 x 6 20 x 6 3 x 6 \*\*****0 600 720 738 740*** **Use whole numbers and decimals**
* **Introduce compact short division**

 **239 ÷ 8 =**  **2 9 r7****8 2 3 79*** **Be able to explain and apply**
 | * **Continue to use number line and compact short division methods as in Yr 5**
* **HTU ÷ TU/ ThHTU ÷ TU**
* **Introduce long division**

 **432 ÷ 15 =**  **28 r 12** **15 432** **-300 (20x15=300)** **132** **-120 (8x15=120)** **12*** **Use whole numbers and decimals, including interpreting remainders as decimals or fractions**
* **Be able to explain and apply**
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| **MULTIPLICATION GUIDELINES** |
| **Year One** | **Year Two** | **Year Three** |
| * **Count, use concrete apparatus, use jottings or unitise to solve questions such as:**

**How many wheels on 3 bikes?****Can you make a tower three times higher that this one?*** **Count in 10s to 100**
* **Count in 2s to 20**
* **Double numbers to 5, then 10**
* **Use coins to count in 2s, 5s and 10s**
* **Be able to explain and apply**
 | * **Count on in steps of 2, 3, 5 and 10**
* **Quick recall of multiplication facts for 2x, 5x and 10x tables and use this to work out division questions**

**How many groups of 2 in 20?*** **Use a numbertrack, numberline or hundred square as support**
* **Repeated addition**

**5 + 5 + 5 + 5 = 20*** **Make arrays to show multiplication as equal groups**

**3 x 5 = 15 or 5 x 3 = 15** **x x x x x x x x** **x x x x x x x x** **x x x x x x x x**  **x x x** **x x x** * **Use x and =**
* **Doubling to 10 and beyond**
* **Be able to explain and apply**
 | * **Count on in steps of 50 and 100**
* **Quick recall of multiplication facts for 2x, 3x 4x, 5x, 6x, 8x and 10x tables**
* **Single digit x1, x10, x100**
* **Doubling all numbers to 20**
* **Related facts eg. 7 x 5 = 5 x 7**
* **Division facts**

 **7 x 5 = 35**  **5 x 7 = 35** **35 ÷** **7 = 5** **35 ÷ 5 = 7*** **Use grid method TU x U**

 **14 x 8 = 112**

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| **X** | **10** | **4** |
| **8** |  **80** |  **32** |

 **80 + 32 = 112** * **Be able to explain and apply**
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| **MULTIPLICATION GUIDELINES** |
| **Year Four** | **Year Five** | **Year Six** |
| * **Quick recall of multiplication facts up to**

**12 x 12*** **Continue to use grid method as numbers become more complex**
* **HTU x U / ThHTU**

 **147 x 4**

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| **X** | **100** | **40** | **7** |
| **4** |  **400** |  **160** |  **28**  |

 **400 + 100 + 60 + 28 = 588** **or** **560 + 28 = 588*** **Be able to explain and apply**
 | * **Use of grid method for all long multiplication questions**
* **HTU x TU**
* **ThHTU x TU**
* **2dp x U eg. as in money**

 **£3.86 x 7 =**

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| **X** | **£3** | **80p** | **6p** |
| **7** |  **£21** |  **560p****(£5.60)**  | **42p** |

 **£21 + £5 = £26** **60p + 42p = £1.02** **£26 + £1.02 = £27.02*** **If decimals are not in context of money, multiply as whole numbers and use approximation to establish place value in answer :**

 **5.07m x 8 calculate as**  **507 x 8 = 4056*** **Be able to explain and apply**
 | * **Children continue to use the grid method as PREFERRED WRITTEN METHOD FOR MULTIPLICATION**
* **Introduce short compact multiplication**

 **625 x 6** **625** **x 6** **3750**  **1 3** * **Introduce long multiplication ONLY AT TEACHER DISCRETION FOR INDIVIDUAL CHILDREN**

 **2 3 4**  **x 2 4**  **9 3 6****+ 4 6 8 0**  **5 6 1 6** * **Be able to explain and apply**
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| **FRACTIONS GUIDELINES** |
| **Year One** | **Year Two** | **Year Three** |
| * **Find half of an object/shape**
* **Find half of a quantity**

**½ of 6 = 3** **\* \*** **\* \*** **\* \**** **Find quarter of an object/shape**
* **Find quarter of a quantity**
* **Find half of an object/shape**
* **Find half of a quantity**

**¼ of 8 = 2****\* \* \* \*** **\* \* \* \***  | * **Find 1/2, 1/3, 1/4, 2/4, 3/4 of an object/shape**
* **Find 1/2, 1/3, 1/4, 2/4, 3/4 of a length**
* **Find 1/2, 1/3, 1/4, 2/4, 3/4 of a quantity**

**3 of 8 = 6****\* \* \* \*** **\* \* \* \*** * **Recognise 1/2, 1/3, 1/4, 2/4, 3/4 in numerical form and know for example that it means ‘one in every two’ or ‘one in every four’**
* **Find equivalent fractions eg. 1/2 = 2/4**
 | * **Count up and down in 1/10s and 1/100s**
* **Divide quantities into ten/a hundred equal parts**
* **Use a bar model to find fractions of a set of objects/quantity**

**1/5 of 10 = 2**

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| **10** |
| **2** | **2** | **2** | **2** | **2** |
| **\* \*** | **\* \*** | **\* \*** | **\* \*** | **\* \*** |

* **Find equivalent fractions using a bar model**

**4/10 of 10 = 4****2/5 of 10 = 4**

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| **10** |
| **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| **2** | **2** | **2** | **2** | **2** |
| **\* \*** | **\* \*** | **\* \*** | **\* \*** | **\* \*** |

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| **FRACTIONS GUIDELINES** |
| **Year Four** | **Year Five** | **Year Six** |
| * **Count up and down in 1/10s and 1/100s**
* **Divide quantities into ten/a hundred equal parts**
* **Use a bar model to find fractions of a set of objects/quantity**

**1/5 of 10 = 2**

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| **10** |
| **2** | **2** | **2** | **2** | **2** |
| **\* \*** | **\* \*** | **\* \*** | **\* \*** | **\* \*** |

* **Find equivalent fractions using a bar model**

**4/10 of 10 = 4****2/5 of 10 = 4**

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| **10** |
| **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| **2** | **2** | **2** | **2** | **2** |
| **\* \*** | **\* \*** | **\* \*** | **\* \*** | **\* \*** |

* **Add/subtract fractions with the same denominator**
 | * **Compare and order fractions with the same denominator**
* **Recognise and use mixed numbers and improper fractions and convert them to use**

**2/5 + 4/5 = 6/5 = 1 1/5*** **Add/subtract fractions with the same denominator**
* **Multiply fractions and mixed numbers by a whole number**
 | * **Rounding to 3 decimal places**
* **Comparing and ordering numbers to three decimal places**
* **Compare and order fractions with same and mixed denominator**
* **Add/subtract fractions with different denominators by converting to make them the same, using the concept of equivalent fractions**
* **Multiply pairs of fractions**
* **1/4 x 1/2 = 1/8**
* **Divide fractions by whole numbers**
* **1/3 ÷ 2 = 1/6**
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