# Waltham St. Lawrence Primary School

# Calculation Policy

# AIMS OF THE POLICY

• To ensure consistency and progression in our approach to calculation and enable a smooth transition between year groups and key stages.

• To ensure that children develop an efficient, reliable, formal written method of calculation for all operations.

• To ensure that children can use these methods accurately with confidence and understanding.

• To ensure pupils understand important concepts and make connections within mathematics.

• To ensure pupils show high levels of fluency in performing written and mental calculations.

• To ensure that pupils are competent in fluency, reasoning and problem solving and can make informed and appropriate choices about the methods they wish to use (mental or written) to solve mathematical problems efficiently and effectively.

The policy is set out in subjects, addition, subtraction, multiplication and division. Within each specific area there is a progression of skills, knowledge and layout for written methods that has been agreed by all staff. The calculation strategies which will be used will reflect this ideology – moving from concrete to pictorial and then abstract recording leading to more formal written methods. Mental methods and strategies will work in partnership with these methods.

It has been agreed by all staff that a variety of mental calculation methods will be taught and that recall of facts will be taught in school and tested regularly. The progression of mental methods and expectations will comply with the new National Curriculum statements 2014.

| | Year | Mental calculation | Written Calculation | Minimum requirements for ALL children |
|---|---|---|---|---|
| ***Addition*** | ***Y1*** | Number bonds ('story of' 5, 6, 7, 8, 9 and 10)<br>Count on in ones from a given 2-digit number<br>Add two single-digit numbers<br>Add three single-digit numbers spotting doubles or pairs to 10<br>Count on in tens from any given 2-digit number<br>Add 10 to any given 2-digit number<br>Use number facts to add single-digit numbers to two-digit numbers, e.g. use 4 + 3 to work out 24 + 3, 34 + 3…<br>Add by putting the larger number first | | Pairs with a total of 10<br>Counting in ones<br>Counting in tens<br>Count on 1 from any given 2-digit number |
| | ***Y2*** | Number bonds – knowing all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20<br>Count on in ones and tens from any given 2-digit number<br>Add two or three single-digit numbers<br>Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10. (E.g. 45 + 4, 38 + 7)<br>Add 10 and small multiples of 10 to any given 2-digit number<br>Add any pair of 2-digit numbers | To experience:<br>Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers<br>Begin to use compact column addition to add numbers with three digits.<br>*n.b. The are no statutory requirements for written calculations to be carried out at Key Stage 1* | Know pairs of numbers which make each total up to 10<br>Add two single digit numbers<br>Add a single-digit number to a 2-digit number by counting on in ones<br>Add 10 and small multiples of 10 to a 2-digit number by counting on in tens |
| | ***Y3*** | Know pairs with each total to 20<br>Know pairs of multiples of 10 with a total of 100<br>Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning<br>Add multiples and near multiples of 10 and 100<br>Perform place value additions without a struggle. (E.g. 300 + 8 + 50 = 358)<br>Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number. (E.g. 104 + 56 is 160 since 104+50=154 and 6+4=10 and 676 + 8 is 684 since 8=4+4 and 76+4+4=84)<br>Add pairs of 'friendly' 3-digit numbers, e.g. 320 + 450<br>Begin to add amounts of money using partitioning. | Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers<br>Begin to use compact column addition to add numbers with three digits.<br>Begin to add like fractions. (E.g. $^{3}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$)<br>Recognise fractions that add to 1. (E.g. ¼ + ¾ or $^{3}/_{5}$ + $^{2}/_{5}$) | Know pairs of numbers which make each total up to 10, and which total 20<br>Add two 2-digit numbers by counting on in tens and ones (E.g. 56 + 35 is 56 + 30 and then add the 5)<br>Understand simple place value additions: 200 + 40 + 5 = 245<br>Use place value to add multiples of 10 or 100 |

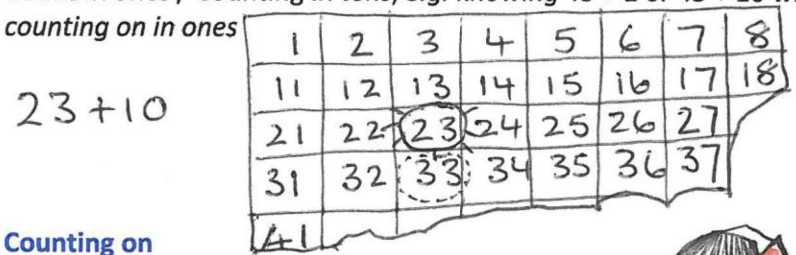
| i t | Year | Mental calculation | Written Calculation | Minimum requirements for ALL children |
|---|---|---|---|---|
| | ***Y4*** | Add any two 2-digit numbers by partitioning or counting on<br>Know by heart/quickly derive number bonds to 100 and to £1<br>Add to the next hundred, pound and whole number. (E.g. 234 + 66 = 300, 3.4 + 0.6 = 4)<br>Perform place value additions without a struggle. (E.g. 300 + 8 + 50 + 4000 = 4358)<br>Add multiples and near multiples of 10, 100 and 1000.<br>Add £1, 10p, 1p to amounts of money<br>Use place value and number facts to add 1-, 2-, 3-and 4-digit numbers where a mental calculation is appropriate'. (E.g. 4004 + 156 by knowing that 6+4=10 and that 4004+150= 4154 so total is 4160) | Column addition for 3-digit and 4-digit numbers<br>Add like fractions, e.g. $^3/_5 + {}^4/_5 = {}^7/_5 = 1\ {}^2/_5$.<br>Be confident with fractions that add to 1 and fraction complements to 1. (E.g. $^2/_3$ + ? = 1) | Add any 2-digit numbers by partitioning or counting on<br>Number bonds to 20<br>Know pairs of multiples of 10 with a total of 100<br>Add friendly larger numbers using knowledge of place value and number facts<br>Use expanded column addition to add 3-digit numbers |
| | ***Y5*** | Know numbers bonds to 1 and to the next whole number<br>Add to the next 10 from a decimal number, *e.g. 13·6 + 6·4 = 20*<br>Add numbers with two significant digits only, using mental strategies. (E.g. 3.4 + 4.8 or 23,000 + 47,000)<br>Add one or two-digit multiples of 10, 100, 1000, 10,000 and 100,000. (E.g. 8000 + 7000 or 600,000 + 700,000)<br>Add near multiples of 10, 100, 1000, 10,000 and 100,000 to other numbers. (E.g. 82,472 + 30,004)<br>Add decimal numbers which are near multiples of 1 or 10, including money. *(E.g. 6·34 + 1·99 or £34·59 + £19·95)*<br>Use place value and number facts to add two or more friendly numbers including money and decimals. (E.g. 3 + 8 + 6 + 4 + 7, 0.6 + 0.7 + 0.4, or 2,056 + 44) | Use column addition to add two or three whole numbers with up to 5 digits<br>Use column addition to add any pair of two-place decimal numbers including amounts of money.<br>Begin to add related fractions using equivalences. (E.g. $½ + {}^1/_6 = {}^3/_6 + {}^1/_6$)<br>Choose the most efficient method in any given situation | Add numbers with only 2-digits which are not zeros, e.g. 3.4 + 5.8<br>Derive swiftly and without any difficulty number bonds to 100<br>Add friendly large numbers using knowledge of place value and number facts<br>Use expanded column addition to add pairs of 4- and 5-digit numbers |
| | **Y6** | Know by heart number bonds to 100 and use these to derive related facts. (E.g. 3.46 + 0.54 = 4)<br>Derive quickly and without difficulty, number bonds to 1000<br>Add small and large whole numbers where the use of place value or number facts makes the calculation do-able 'in our heads'. (E.g. 34,000 + 8000.)<br>Add multiples of powers of ten and near multiples of the same. (E.g. 6345 + 199.)<br>Add negative numbers in a context such as temperature where the numbers make sense.<br>Add two 1-place decimal numbers or two 2-place decimal numbers less than 1 (E.g. 4.5 + 6.3 or 0.74 + 0.33)<br>Add positive numbers to negative numbers, e.g. calculate a rise in temperature, or continue a sequence beginning with a negative number | Use column addition to add numbers with up to 5 digits.<br>Use column addition to add decimal numbers with up to 3-digits<br>Add mixed numbers and fractions with different denominators. | Derive swiftly and without difficulty, number bonds to 100<br>Use place value and number facts to add friendly large or decimal numbers, e.g. 3.4 + 6.6 or 26,000 + 5,400<br>Use column addition to add numbers with up to 4-digits.<br>Use column addition to add pairs of two-place decimal numbers. |

# Mental Addition

## Year 1

### Using Place value

Count in ones / Counting in tens, *e.g. knowing 45 + 1 or 45 + 10 without counting on in ones*




### Counting on

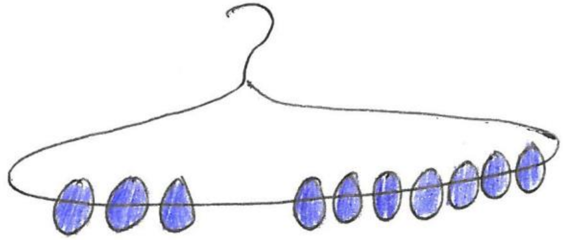
Count on in ones, *e.g. 11 + 2 =*   *7 + 4 =*

Count on in tens, *e.g. 45 + 20 as 45, 55, 65*

### Using number facts

'Story' of 4, 5, 6, 7, 8 and 9, *e.g. 7 = 7 + 0 or 6 + 1 or 5 + 2 or 4 + 3*

Number bonds to 10, *e.g. 5 + 5, 6 + 4, 7 + 3, 8 + 2, 9 + 1, 10 + 0*



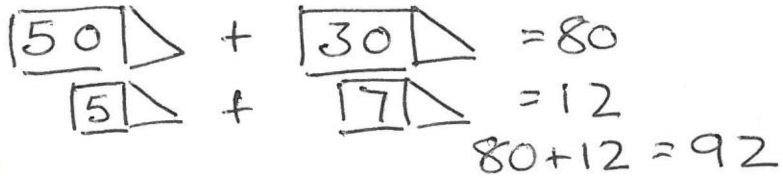
Patterns using known facts, *e.g. 4 + 3 = 7 so we know 24 + 3, 44 + 3, 74 + 3, etc.*

## Year 2

### Using Place value

Know 1 more or 10 more than any number, *e.g. 1 more than 67 or 10 more than 85*

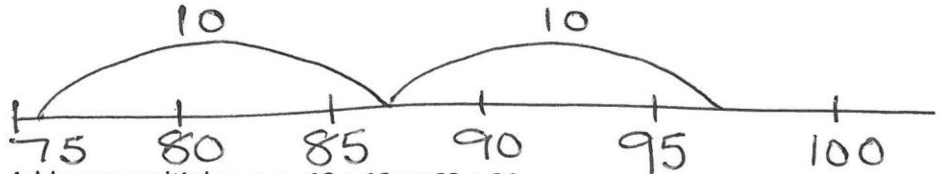
Partitioning, *e.g. 55 + 37 as 50 + 30 and 5 + 7 finally combining the two totals: 80 + 12*




### Counting on

Add ten and multiples of ten, *e.g. 76 + 20 as 76, 86, 96 or in one hop 76 + 20*

Add two 2-digit numbers by counting on in tens then in ones, *e.g. 55 + 37 as 55 add 30 (85) add 7 (92)*



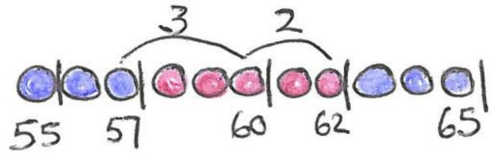

Add near multiples, *e.g. 46 + 19 or 63 + 21*

### Using number facts

Know pairs of numbers which make the numbers up to and including 10, *e.g. 8 = 4&4, 3&5, 2&6, 1&7 and 10 = 5&5, 4&6, 3&7, 2&8, 1&9, 0&10*

Patterns of known facts, *e.g. 6 + 3 = 9, so we know 36 + 3 = 39, 66 + 3 = 69, 53 + 6 = 59*

Bridging ten, *e.g. 57 + 5 as 57 add 3 then add 2 more*



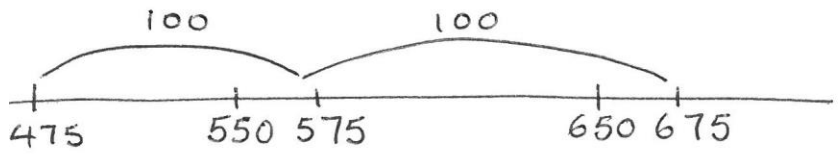

Adding three or more single-digit numbers, spotting bonds to 10 or doubles, *e.g. 6 + 7 + 4 + 2 as 10 + 7 + 2*

## Mental Addition

### Year 3

**Using Place value**

Count in hundreds, *e.g. knowing 475 + 200 as 475, 575, 675*




Add multiples of 10, 100 and £1, *e.g. 746 + 200 or 746 + 40 or £6.34 + £5 as £6 + £5 and 34p*

Partitioning, *e.g. 68 + 74 as 60 + 70 and 8 + 4 and combine the totals: 130 + 12 = 142 or £8.50 + £3.70 as £8 + £3 and 50p +70p and combine: £11 + £1.20*

**Counting on**

Add two 2-digit numbers by adding the multiple of ten then the ones, *e.g. 67 + 55 as 67 add 50 (117) add 5 (122)*

Add near multiples of 10 and 100, *e.g. 67 + 39 or 364 + 199*

Count on from 3-digit nos, *e.g. 247 + 34 as 247 + 30 (277) then 277 + 4 = 281*

**Using number facts**

Number bonds to 100, *e.g. 35 + 65, 46 + 54, 73 + 27, etc.*

Add to next ten and next hundred, *e.g. 176 + 4 = 180, 435 + 65 = 500, etc.*

### Year 4

**Using Place value**

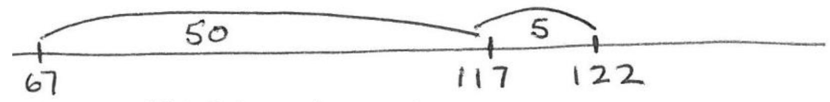
Count in thousands, *e.g. knowing 475 + 200 as 475, 575, 675*

Partitioning, *e.g. 746 + 203 as 700 + 200 and 46 + 3 or 134 + 707 as 130 + 700 and 4 + 7*

**Counting on**

Add two 2-digit numbers by adding the multiple of ten then the ones, *e.g. 67 + 55 as 67 add 50 (117) add 5 (122)*

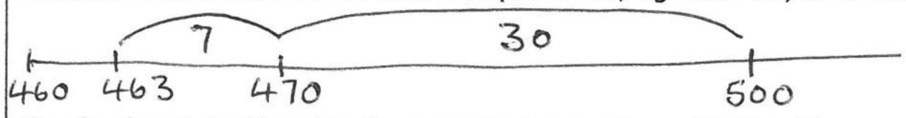
Add near multiples of 10, 100 and 1000, *e.g. 467 + 199 or 3462 + 2999*




Count on to add 3-digit numbers and money, *e.g. 463 + 124 as 463 + 100 (563) +20 (583) +4 =587 or £4.67 + £5.30 as £9.67 add 30p*

**Using number facts**

Number bonds to 100 and to next multiple of 100, *e.g. 463 + 37, 1353 + 47*




Number bonds to £1 and to the next whole pound, *e.g. £3.45 + 55p*

Add to next whole number, *e.g. 4.6 + 0.4, 7.2 + 0.8*

## Written Addition

### Year 3

Expanded column addition with 'carrying'

Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers

```
  400   60   6
+ 300   50   8
  800   20   4
  100   10
```

```
  347
  286
  495
 1128
  21
```

Compact column addition with 3-digit and 4-digit numbers

Recognise fractions which add to 1, *e.g.* $\frac{1}{4} + \frac{3}{4}$ or $^2/_5 + ^3/_5$

### Year 4

Compact column addition with larger numbers.

Use expanded and compact column addition to add amounts of money.

```
  5347
  2286
+ 1495
  9128
  121
```

Add like fractions, *e.g.* $^3/_8 + ^1/_8 + ^1/_8$

## Written Addition

### Year 5

Compact column addition to add
Pairs of 5-digit numbers

Continue to use column addition to add
towers of several larger numbers.

Use compact addition to add decimal
numbers with up to two places

```
  15.68
 +27.86
  43.54
  11 1
```

Adding fractions with related denominators,
*e.g.* $\frac{1}{4} + \frac{3}{8} = \frac{5}{8}$

### Year 6

Compact column addition
for adding several large numbers
and decimal numbers with up
to two places

```
   £14·64
 + £28·78
   £12·26
   £55.68
    11 1
```

Compact column addition with
money

Add fractions with unlike denominators, *e.g.* $\frac{3}{4} + 1/3 = 1\ 1/12$ *or* $13/12$
$2\ \frac{1}{4} + 1\ 1/3 = 3\ 7/12$

## Mental Addition

### Year 5

**Using Place value**
Count in 0.1s, 0.01s, *e.g. knowing*
*what 0.1 more than 0.51 is*

| 100s | 10s | 1s | 0·1s | 0·01s | 0·001s |
|---|---|---|---|---|---|
| | | | ·5 | 1 | |
| | | | ·1 | | |
| | | | ·6 | 1 | |

Partitioning, *e.g. 2.4 + 5.8 as 2 + 5 and*
*0.4 + 0.8 and combine the totals: 7 + 1.2 = 8.2*

2·4 + 5·8
7 + 1·2 = 8·2

**Counting on**
Add two decimal numbers by adding the ones then the tenths/hundredths,
*e.g. 5.72 + 3.05 as 5.72 add 3 (8.72) then add 0.05 (8.77)*
Add near multiples of 1, *e.g. 6.34 + 0.99 or 5.63 + 0.9*
Count on from large numbers, *e.g. 6834 + 3005 as 9834 + 5*

**Using number facts**
Number bonds to 1 and to the next whole number, *e.g. 0.4 + 0.6 or 5.7 + 0.3*

Add to next ten from a decimal number, *e.g. 7.8 + 2.2 = 10*

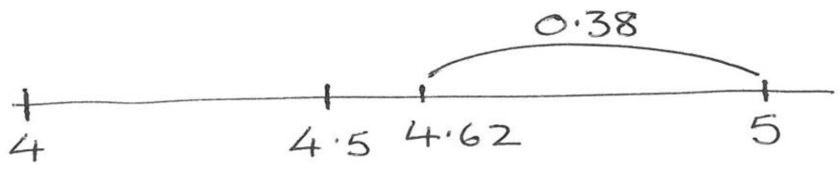
### Year 6

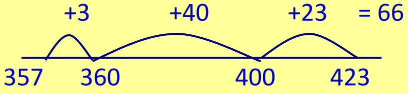
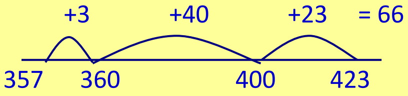
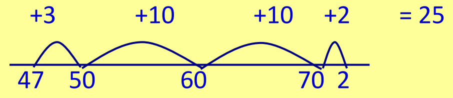
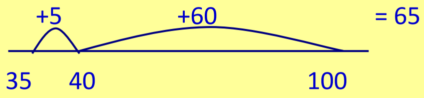
**Using Place value**
Count in 0.1s, 0.01s, 0.001s, *e.g. knowing*
*what 0.001 more than 6.725 is*
Partitioning, *e.g. 9.54 + 3.25 as 9 + 3 and*
*0.5 + 0.2 and 0.04 + 0.05 to get 12.79*

| 100s | 10s | 1s | 0·1s | 0·01s | 0·001s |
|---|---|---|---|---|---|
| | | 6· | 7 | 2 | 5 |
| | | · | 0 | 0 | 1 |
| | | 6· | 7 | 2 | 6 |

**Counting on**
Add two decimal numbers by adding the ones then the tenths/hundredths or
thousandths, *e.g. 6.314 + 3.006 as 6.314 add 3 (9.314) then add 0.006 (9.32)*
Add near multiples of 1, *e.g. 6.345 + 0.999 or 5.673 + 0.9*
Count on from large numbers, *e.g. 16,375 + 12,003*

**Using number facts**
Number bonds to 1 and to next multiple of 1, *e.g. 0.63 + 0.37 or 2.355 + 0.645*
Add to next ten, *e.g. 4.62 + 0.38*



| | Year | Mental calculation | Written Calculation | Minimum requirements for ALL children |
|---|---|---|---|---|
| *Subtraction* | **Y1** | Number bonds ('story of' 5, 6, 7, 8, 9 and 10)<br>Count back in ones from a given 2-digit number<br>Subtract one single-digit number from another<br>Count back in tens from any given 2-digit number<br>Subtract 10 from any given 2-digit number<br>Use number facts to subtract single-digit numbers from two-digit numbers, e.g. use 7 – 2 to work out 27 – 2, 37 – 2… | | Pairs with a total of 10<br>Counting back in ones from 20 to 0<br>Counting back in tens from 100 to 0<br>Count back 1 from any given 2-digit number |
| | **Y2** | Number bonds – knowing all the pairs of numbers which make all the numbers to 12<br>Count back in ones and tens from any given 2-digit number<br>Subtract a single-digit number from any 2-digit number using number facts, including bridging multiples of 10, e.g. 56 – 3, 53 – 5.<br>Subtract 10 and small multiples of 10 from any given 2-digit number<br>Subtract any pair of 2-digit numbers by counting back in tens and ones or by counting up. | To experience:<br>Use counting up as an informal written strategy for subtracting pairs of three-digit numbers, e.g.<br>423 – 357 is<br><br>*n.b. The are no statutory requirements for written calculations to be carried out at Key Stage 1* | Know pairs of numbers which make each total up to 10<br>Subtract a single-digit number from a 2-digit number by counting back in ones<br>Subtract 10 and small multiples of 10 from a 2-digit number by counting back in tens |
| | **Y3** | Know pairs with each total to 20<br>Subtract any two 2-digit numbers<br>Perform place value subtractions without a struggle. (E.g. 536 – 30 = 506, etc.)<br>Subtract 2-digit numbers from numbers >100 by counting up. (E.g. 143 – 76 is done by starting at 76, add 4 (80) then add 20 (100) then add 43 making the difference a total of 67)<br>Subtract multiples and near multiples of 10 and 100<br>Subtract, when appropriate, by counting back or taking away, using place value and number facts.<br>Find change from £1, £5 and £10. | Use counting up as an informal written strategy for subtracting pairs of three-digit numbers, e.g.<br>423 – 357 is<br><br>Begin to subtract like fractions. (E.g. $^{7}/_{8}$ - $^{3}/_{8}$) | Know pairs of numbers which make each total up to 10, and which total 20<br>Count up to subtract 2-digit numbers: 72 – 47 is<br><br>Subtract multiples of 5 from 100 by counting up<br><br>Subtract multiples of 10 and 100 |

| | | | | |
|---|---|---|---|---|
| | **Y4** | Subtract any two 2-digit numbers<br>Know by heart/quickly derive number bonds to 100<br>Perform place value subtractions without a struggle. (E.g. 4736 – 706 = 4030, etc.)<br>Subtract multiples and near multiples of 10, 100 and 100<br>Subtract by counting up. (E.g. 503 – 368 is done by adding: 368 +2 +30 +100 +3 so we added 135)<br>Subtract, when appropriate, by counting back or taking away, using place value and number facts.<br>Subtract £1, 10p, 1p from amounts of money<br>Find change from £10, £20 and £50. | Use expanded column subtraction for 3-digit and 4-digit numbers<br>Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100<br>E.g. 2002 – 1865 is<br>+5 +30 +102 = 137<br>1865 1870 1900 2002<br>Subtract like fractions, e.g. $\frac{1}{4} + {}^{1}/_{8} = {}^{3}/_{8}$<br>Use fractions that add to 1 to find fraction complements to 1, e.g. $1 - {}^{2}/_{3} = {}^{1}/_{3}$ | Use counting up with confidence to solve most subtractions, including finding complements to multiples of 100. (E.g. 512 – 287 is done by<br>+3 +10 +100 +100 +12 = 225<br>287 290 300 400 500 512<br>67 + ? = 100 +3 +30 = 33<br>67 70 100 |
| | **Y5** | Subtract numbers with two significant digits only, using mental strategies. (E.g. 6.2 – 4.5 or 72,000 – 47,000)<br>Subtract one or two-digit multiples of 100, 1000, 10,000 and 100,000. (E.g. 8000 – 3000 or 600,000 – 200,000)<br>Subtract one or two digit near multiples of 100, 1000, 10,000 and 100,000 from other numbers. (E.g. 82,472 – 30,004)<br>Subtract decimal numbers which are near multiples of 1 or 10, including money. (E.g. 6·34 – 1·99 or £34·59 – £19·95)<br>Use counting up subtraction, with knowledge of number bonds to 10/100 or £1, as a strategy to perform mental subtraction. (E.g. £10 - £3.45 or 1000 – 782]<br>Recognise fraction complements to 1 and to the next whole number. (E.g. $1\,{}^{2}/_{5} + {}^{3}/_{5} = 2$) 4 – 5 | Use compact or expanded column subtraction to subtract numbers with up to 5 digits.<br>Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000.<br>Use complementary addition for subtractions of decimals with up to two places incl. amounts of money<br>Begin to subtract related fractions using equivalences. (E.g. $\frac{1}{2} - {}^{1}/_{6} = {}^{2}/_{6}$)<br>Choose the most efficient method in any given situation | Derive swiftly and without difficulty number bonds to 100<br>Use counting up with confidence to solve most subtractions, including finding complements to multiples of 1000. (E.g. 3000 – 2387 is done by<br>+3 +10 +600 = 613<br>2387 2390 2400 3000 |
| | **Y6** | Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition. (E.g. 1000 – 654 as 46 + 300 in our heads<br>Use number bonds to 1 and 10 to perform mental subtraction of any pair of one-place or two-place decimal numbers using complementary addition and including money. (E.g. 10 – 3.65 as 0.35 + 6, £50 – £34.29 as 71p + £15)<br>Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to two places. (E.g. 467,900 – 3,005 or 4.63 – 1.02)<br>Subtract multiples of powers of ten and near multiples of the same.<br>Subtract negative numbers in a context such as temperature where the numbers make sense. | Use column subtraction to subtract numbers with up to 6 digits.<br>Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10,000.<br>Use complementary addition for subtractions of decimal numbers with up to three places including money.<br>Subtract mixed numbers and fractions with different denominators. | Use number bonds to 100 to perform mental subtraction of numbers up to 1000 by complementary addition. (E.g. 1000 – 654 as 46 + 300 in our heads.)<br>Use complementary addition for subtraction of integers up to 10,000. E.g. 2504 – 1878 as<br>+2 +20 +100 +504 = 626<br>1878 1880 1900 2000 2504<br>Use complementary addition for subtractions of one-place decimal numbers and amounts of money. (E.g. £7.30 – £3.55 as<br>+5p +40p +£3.30 = £3.75<br>£3.55 £3.60 £4.00 £7.30 |

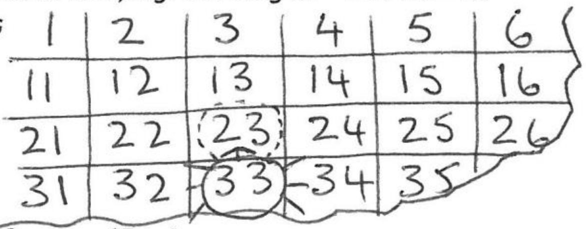
## Mental Subtraction

### Year 1

**Using Place value**

Count back in ones / Count back in tens, *e.g. knowing 53 – 1 or 53 – 10 without counting back in ones*

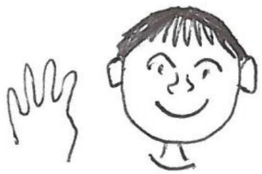
33 – 10




**Taking away**

Count back in ones, *e.g. 11 – 3 = 15 – 4 =*

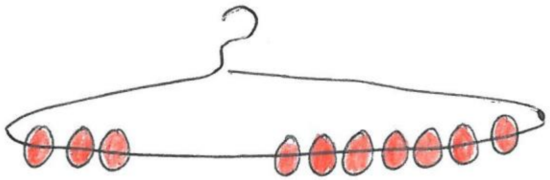
Count back in tens, *e.g. 53 – 20 as 53, 43, 33*



**Using number facts**

'Story' of 4, 5, 6, 7, 8 and 9, *e.g. 7 – 1 = 6, 7 – 2 = 5, 7 – 3 = 4, etc.*

Number bonds to 10, *e.g. 10 – 1 = 9, 10 – 2 = 8, 10 – 3 = 7, etc.*



Patterns using known facts, *e.g. 7 – 3 = 4 so we know 27 – 3 =, 47 – 3 =, 77 – 4 =, etc.*

### Year 2

**Taking away**

Subtract ten and multiples of ten, e.g. *76 – 20 as 76, 66, 56 or in one hop 76 – 20 = 56*

Subtract two 2-digit numbers by counting back in tens then in ones, *e.g.* 67 – 33 as 67 subtract 30 (37) then count back 3 (34)

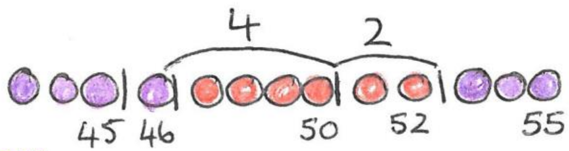
Subtracting near multiples, *e.g. 74 – 21 or 57 – 19*

**Using number facts**

Know pairs of numbers which make the numbers up to and including 10, *e.g. 10 – 6 = 4, 8 – 3 = 5, 5 – 2 = 3, etc.*

Patterns of known facts, *e.g. 9 – 6 = 3, so we know 39 – 6 = 33, 69 – 6 = 63, 89 – 6 = 83*

Bridge ten, *e.g. 52 – 6 as 52 subtract 2 then subtract 4 more*




**Counting up**

Find a difference between two numbers on a line, *e.g. 51 – 47*

<table>
<tr><th></th><th>Year 3</th><th>Year 4</th></tr>
<tr><td>Mental Subtraction</td><td>Counting up<br>Find a difference between two numbers by counting up from the smaller to the larger, e.g. 121 – 87<br>3 10 20 1<br>87 90 100 120 121<br>Using number facts<br>Number bonds to 100, e.g. 100 – 35 = 65, 100 – 48 = 52, etc.</td><td>Counting up<br>Find a difference between two numbers by counting up from the smaller to the larger, e.g. 506 – 387<br>3 10 106<br>387 390 400 506<br>Using number facts<br>Number bonds to 10, 100 and derived facts, e.g. 100 – 76 = 24, 1.0 – 0.6 = 0.4<br>Number bonds to £1 and £10, e.g. £1.00 – 86p = 14p or £10 – £3.40 = £6.60</td></tr>
<tr><td>Written Subtraction</td><td>Develop counting up subtraction<br>3 30<br>167 170 200<br><br>Use counting up subtraction to find change from £1 and £10<br>16p £3<br>£6·84 £7 £10<br><br>Recognise complements of any fraction to 1, e.g. $1 - \frac{1}{4} = \frac{3}{4}$ or $1 - {}^{2}/_{3} = {}^{1}/_{3}$</td><td>Expanded column subtraction<br>$\begin{array}{rrrr} & 600 & 110 & 16 \\ & \cancel{700} & \cancel{20} & \cancel{6} \\ - & 300 & 50 & 8 \\ \hline & 300 & 60 & 8 \end{array} \longrightarrow$<br>Begin to use compact column subtraction<br>$\begin{array}{rrrr} & 6 & 11 & 16 \\ & \cancel{7} & \cancel{2} & \cancel{6} \\ - & 3 & 5 & 8 \\ \hline & 3 & 6 & 8 \end{array}$<br><br>Use counting up subtraction to find change from £10, £20, £50 and £100<br>25p £5 £10<br>£34·75 £35 £40 £50<br><br>Subtract like fractions, e.g. ${}^{3}/_{8} - {}^{1}/_{8} = {}^{2}/_{8}$</td></tr>
</table>

## Mental Subtraction

### Year 5

**Taking away**

Use place value to subtract decimals, *e.g. 4.58 – 0.08 or 6.26 – 0.2, etc.*
Take away multiples of powers of 10, *e.g. 15,672 – 300 or 4.82 – 2 or 2.71 – 0.5 or 4.68 – 0.02*
Partition or count back, *e.g. 3964 – 1051 or 5.72 – 2.01*
Subtract near multiples, *e.g. 86,456 – 9999 or 3.58 – 1.99*

**Counting up**

Find a difference between two numbers by counting up from the smaller to the larger, *e.g. 2009 – 869*

1 30 1009
869 870 1000 2009

Find change using shopkeepers' addition, *e.g. buy toy for £6.89 using £10*

11p £3
£6.89 £7 £10

**Using number facts**

Derived facts from number bonds to 10 and 100, *e.g. 2 – 0.45 using 45 + 55 = 100 or 3.00 – 0.86 using 86 + 14 = 100*

0.04 0.1 2
0.86 0.9 1 3

Number bonds to £1, £10 and £100, *e.g. £4.00 – £3.86p = 14p or £100 – £66 using 66 + 34 = £100*

### Year 6

**Taking away**

Use place value to subtract decimals, *e.g. 7.782 – 0.08 or 16.263 – 0.2, etc.*
Take away multiples of powers of 10, *e.g. 132,956 – 400 or 686,109 – 40,000 or 7.823 – 0.5*
Partition or count back, *e.g. 3964 – 1051 or 5.72 – 2.01*
Subtract near multiples, *e.g. 360,078 – 99,998 or 12.831 – 0.99*

**Counting up**

Count up to subtract numbers from multiples of 10, 100, 1000, 10,000
Find a difference between two decimal numbers by counting up from the smaller to the larger, *e.g. 1.2 – 0.87*

0.03 0.1 0.2
0.87 0.9 1 1.2

**Using number facts**

Derived facts from number bonds to 10 and 100, *e.g. 0.1 – 0.075 using 75 + 25 = 100 or 5 – 0.65 using 65 + 35 = 100*

0.35 4
0.65 1 5

Number bonds to £1, £10 and £100, *e.g. £7.00 – £4.37 or £100 – £66.20 using 20p + 80p = £1 and £67 + £33 = £100.*

## Written Subtraction

### Year 5

Compact column subtraction for numbers with up to 5 digits

$$\begin{array}{cccccc} & 0 & 15 & 13 & 1 & 14 \\ & \cancel{1} & \cancel{6} & \cancel{3} & \cancel{2} & \cancel{4} \\ - & & 8 & 5 & 1 & 6 \\ \hline & & 7 & 8 & 0 & 8 \\ \hline \end{array}$$

Continue to use counting up subtraction for subtractions involving money, including finding change or, *e.g. £50 - £28.76*

24p £1 £20
£28.76 £29 £30 £50

Use counting up subtraction to subtract decimal numbers, *e.g. 4.2 – 1.74*

0.06 0.2 2.2
1.74 1.80 2.0 4.2

Subtracting fractions with like denominators, *e.g.* $1\frac{1}{4} - \frac{3}{8}$ *as* $1\frac{2}{8} - \frac{3}{8}$ or $\frac{10}{8} - \frac{3}{8} = \frac{7}{8}$

### Year 6

Compact column subtraction for large numbers

$$\begin{array}{cccccc} & 2 & 14 & & 7 & 15 \\ & \cancel{3} & \cancel{4} & 6 & \cancel{8} & \cancel{5} \\ - & 1 & 6 & 4 & 5 & 8 \\ \hline & 1 & 8 & 2 & 2 & 7 \\ \hline \end{array}$$

Use counting up subtraction when dealing with money, *e.g. £100 – £78.56 or £45.23 – £27.57*

44p £1 £20
£78.56 £79 £80 £100

Use counting up subtraction to subtract decimal numbers, *e.g. 13.1 – 2.37*

0.13 0.50 10.1
2.37 2.50 3.00 13.1

Subtracting fractions with unlike denominators, *e.g.* $1\frac{1}{4} - \frac{2}{3}$ *as* $1\frac{3}{12} - \frac{8}{12}$ or $\frac{15}{12} - \frac{8}{12} = \frac{7}{12}$

| | Year | Mental calculation | Written Calculation | Minimum requirements for ALL children |
|---|---|---|---|---|
| ***Multiplication*** | **Y1** | Begin to count in 2s, 5s and 10s<br>Begin to say what three 5s are by counting in 5s or what four 2s are by counting in 2s, etc.<br>Double numbers to 10 | | Begin to count in 2s and 10s<br>Double numbers to 5 using fingers |
| | **Y2** | Count in 2s, 5s and 10s<br>Begin to count in 3s.<br>Begin to understand that multiplication is repeated addition and to use arrays (E.g. 3 x 4 is three rows of 4 dots)<br>Begin to learn the 2x, 3x, 5x and 10x tables, seeing these as 'lots of', e.g. 5 lots of 2, 6 lots of 2, 7 lots of 2, etc.<br>Double numbers up to 20<br>Begin to double multiples of 5 to 100<br>Begin to double two-digit numbers less than 50 with 1s digits of 1, 2, 3 4 or 5 | To experience:<br>Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' single digit numbers.<br>*n.b. The are no statutory requirements for written calculations to be carried out at Key Stage 1* | Count in 2s, 5s and 10s<br>Begin to use and understand simple arrays, e.g. 2 x 4 is two lots of four buns.<br>Double numbers up to 10<br>Double multiples of 10 to 50 |
| | **Y3** | Know by heart all the multiplication facts in the 2x, 3x, 4x, 5x, 8x and 10x tables<br>Multiply whole numbers by 10 and 100<br>Recognise that multiplication is commutative<br>Use place value and number facts in mental multiplication. (E.g. 30 x 5 is 15 x 10)<br>Partition teen numbers to multiply by a single-digit number. (E.g. 3 x 14 as 3 x 10 and 3 x 4)<br>Double numbers up to 50 | Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' single digit numbers. | Know by heart the 2x, 3x, 5x and 10x tables<br>Double given tables facts to get others<br>Double numbers up to 25 and multiples of 5 to 50 |
| | **Y4** | Know by heart all the multiplication facts up to 12 x 12.<br>Recognise factors up to 12 of two-digit numbers.<br>Multiply whole numbers and one-place decimals by 10, 100, 1000<br>Multiply multiples of 10, 100, 1000 by single digit numbers. (E.g. 300 x 6 or 4000 x 8)<br>Use understanding of place value and number facts in mental multiplication. (E.g. 36 x 5 is half of 36 x 10 and 50 x 60 = 3000)<br>Partition 2-digit numbers to multiply by a single-digit number mentally. (E.g. 4 x 24 as 4 x 20 and 4 x 4)<br>Multiply near multiples using rounding. (E.g. 33 x 19 as 33 x 20 – 33)<br>Find doubles to double 100 and beyond using partitioning<br>Begin to double amounts of money. (E.g. £35.60 doubled = £71.20.) | Use a vertical written method to multiply a one-digit by a 3-digit number (ladder)<br>Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning (grid method) | Know by heart multiplication tables up to 10 x 10<br>Multiply whole numbers by 10 and 100<br>Use grid method to multiply a 2-digit or a 3-digit number by a number up to and including 6 |

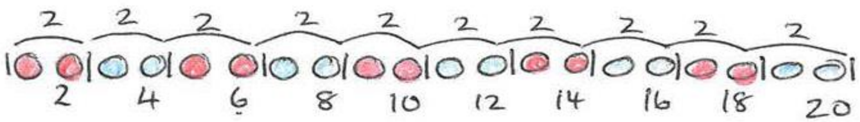
| | | | | |
|---|---|---|---|---|
| | **Y5** | Know by heart all the multiplication facts up to 12 x 12.<br>Multiply whole numbers and one-and two-place decimals by 10, 100, 1000, 10,000<br>Use knowledge of factors and multiples in multiplication. (E.g. 43 x 6 is double 43 x 3, and 28 x 50 is ½ of 28 x 100 = 1400)<br>Use knowledge of place value and rounding in mental multiplication. (E.g. 67 x 199 as 67 x 200 – 67)<br>Use doubling and halving as a strategy in mental multiplication. (E.g. 58 x 5 = half of 58 x 10, and 34 x 4 is 34 doubled twice)<br>Partition 2-digit numbers, including decimals, to multiply by a single-digit number mentally. (E.g. 6 x 27 as 6 x 20 (120) plus 6 x 7 (42) making 162 or 6.3 x 7 as 6 x 7 plus 0.3 x 7)<br>Double amounts of money by partitioning. (E.g. £37.45 doubled = £37 doubled (£74) plus 45p doubled (90p) £74.90) | Use short multiplication to multiply a 1-digit number by a number with up to 4 digits<br>Use long multiplication to multiply 3-digit and 4-digit number by a number between 11 and 20<br>Choose the most efficient method in any given situation<br>Find simple percentages of amounts 9e.g. 10%, 5%, 20%, 155 and 50%)<br>Begin to multiply fractions and mixed numbers by whole numbers ≤ 10, e.g. $4 \times {}^{2}/_{3} = {}^{8}/_{3} = 2{}^{2}/_{3}$. | Know multiplication tables to 11 x 11<br>Multiply whole numbers and one-place decimals by 10, 100 and 1000<br>Use knowledge of factors as aids to mental multiplication. (E.g. 13 x 6 = double 13 x 3 and 23 x 5 is ½ of 23 x 10)<br>Use grid method to multiply numbers with up to 4-digits by one-digit numbers.<br>Use grid method to multiply 2-digit by 2-digit numbers. |
| | **Y6** | Know by heart all the multiplication facts up to 12 x 12.<br>Multiply whole numbers and decimals with up to three places by 10, 100 or 1000, e.g. 234 x 1000 = 234,000 and 0.23 x 1000 = 230)<br>Identify common factors, common multiples and prime numbers and use factors in mental multiplication. (E.g. 326 x 6 is 652 x 3 which is 1956)<br>Use place value and number facts in mental multiplication. (E.g. 40,000 x 6 = 24,000 and 0.03 x 6 = 0.18)<br>Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25 (E.g. 28 x 25 is ¼ of 28 x 100 = 700)<br>Use rounding in mental multiplication. (34 x 19 as (20 x 34) – 34)<br>Multiply one and two-place decimals by numbers up to and including 10 using place value and partitioning. (E.g. 3.6 x 4 is 12 + 2.4 or 2.53 x 3 is 6 + 1.5 + 0.09)<br>Double decimal numbers with up to 2 places using partitioning *e.g. 36·73 doubled is double 36 (72) plus double 0·73 (1·46)* | Use short multiplication to multiply a 1-digit number by a number with up to 4 digits<br>Use long multiplication to multiply a 2-digit by a number with up to 4 digits<br>Use short multiplication to multiply a 1-digit number by a number with one or two decimal places, including amounts of money.<br>Multiply fractions and mixed numbers by whole numbers.<br>Multiply fractions by proper fractions.<br>Use percentages for comparison and calculate simple percentages. | Know by heart all the multiplication facts up to 12 x 12.<br>Multiply whole numbers and one-and two-place decimals by 10, 100 and 1000.<br>Use an efficient written method to multiply a one-digit or a teens number by a number with up to 4-digits by partitioning (grid method).<br>Multiply a one-place decimal number up to 10 by a number ≤100 using grid method. |

## Mental Multiplication

### Year 1

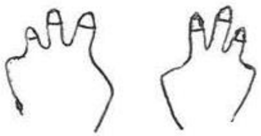
**Counting in steps ('Clever' counting)**

Count in 2s and 10s



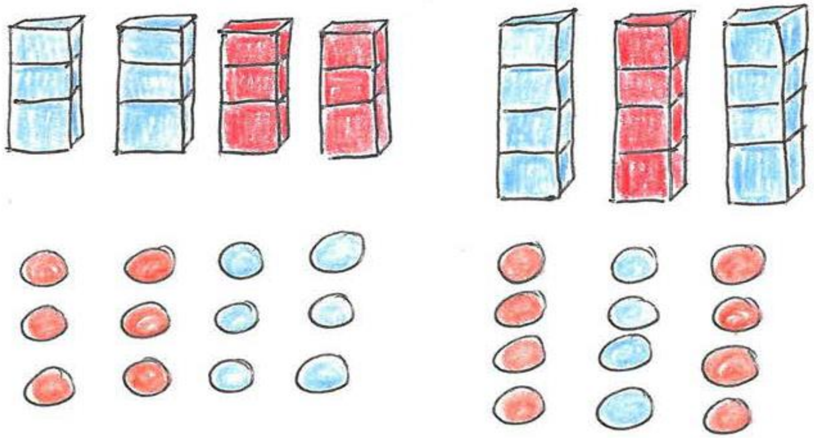

**Doubling and halving**

Find doubles to double 6 using fingers



**Grouping**

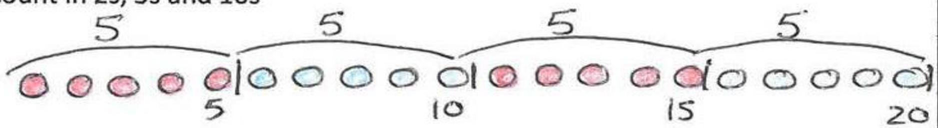
Begin to use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4' or '2 lots of 5', etc.



### Year 2

**Counting in steps ('Clever' counting)**

Count in 2s, 5s and 10s



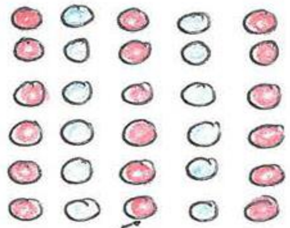

Begin to count in 3s

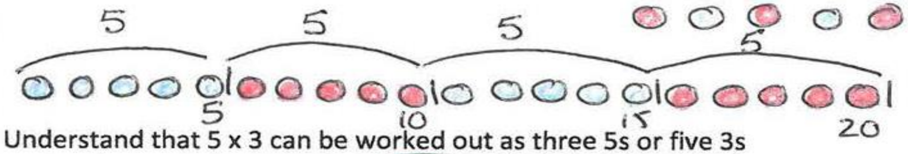
**Doubling and halving**

Begin to know doubles of multiples of 5 to 100, *e.g. double 35 is 70*

**Grouping**

Use arrays to find answers to multiplication and relate to 'clever' counting, *e.g. 3 x 4 as three lots of four things and 6 x 5 as six steps in the 5s count as well as six lots of five*



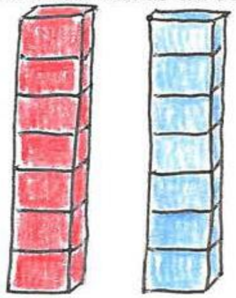



Understand that 5 x 3 can be worked out as three 5s or five 3s

**Using number facts**

Know doubles to double 20

Double 7 = 14



Start learning 2x, 5x, 10x tables, relating these to 'Clever counting' in 2s, 5s, and 10s, *e.g. 5 x 10 = 50, and 10, 20, 30, 40, 50 is five steps in the tens count*

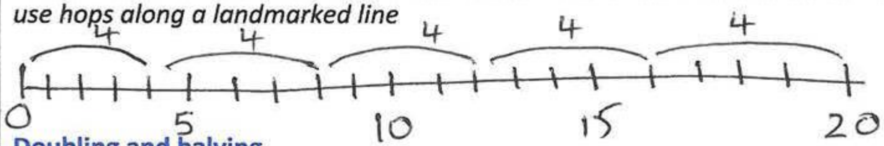
| | Year 3 | Year 4 |
|---|---|---|

## Mental Multiplication

### Year 3

**Counting in steps ('Clever' counting)**

Count in 2s, 3s, 4s, 5s, 8s and 10s, *e.g. colour the multiples on a 1-100 grid or use hops along a landmarked line*

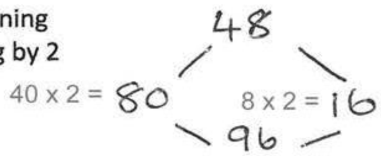



**Doubling and halving**

Find doubles to double 50 using partitioning

Use doubling as a strategy in multiplying by 2

*E.g. 18 x 2 is double 18 (36)*




**Grouping**

Recognise that multiplication is commutative, *e.g. 4 x 8 ≡ 8 x 4*

Multiply multiples of 10 by single digit numbers, e.g. 30 x 8 = 240

Multiply friendly 2-digit numbers by single digit numbers, *e.g. 13 x 4*

**Using number facts**

Know doubles to 20 and doubles of multiples of 5 to 100, *e.g. double 45 is 90*

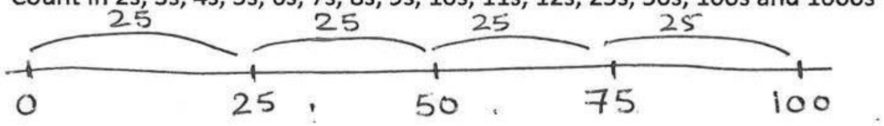
Know doubles of multiples of 5 to 100, *e.g. double 85 is 170*

Know 2x, 3x, 4x, 5x, 8x, 10x tables facts

### Year 4

**Counting in steps – sequences**

Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s

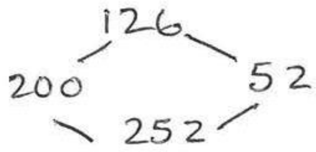



**Doubling and halving**

Find doubles to double 100 and beyond using partitioning

Begin to double amounts of money.

*E.g. £3.50 doubled is £7*




Use doubling as a strategy in multiplying by 2, 4 and 8, *e.g. 34 x 4 = double 34 (68) doubled again (136)*

**Grouping**

Use partitioning to multiply 2-digit numbers by single-digit numbers

Multiply multiples of 100 by single digit numbers using tables facts, *e.g. 400 x 8 = 3200*

Multiply using near multiples by rounding, *e.g. 24 x 19 as (24 x 20) – 24*

**Using number facts -** Know times tables up to 12 x 12

## Written Multiplication

### Year 3

Build on partitioning to develop grid multiplication

| x | 20 | 3 |
|---|---|---|
| 4 | 80 | 12 |

= 92

### Year 4

Use grid multiplication to multiply 3-digit by 1-digit numbers

| x | 200 | 50 | 3 |
|---|---|---|---|
| 6 | 1200 | 300 | 18 |

= 1518

Use a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers

```
  253
X   6
   18
  300
 1200
 1518
```

Use grid multiplication to multiply 2-digit numbers by 2-digit numbers

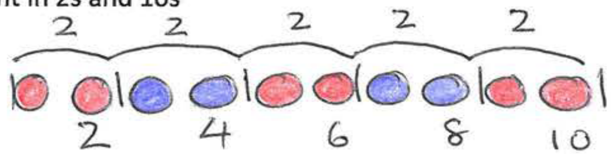
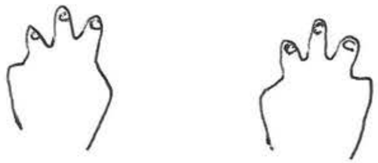
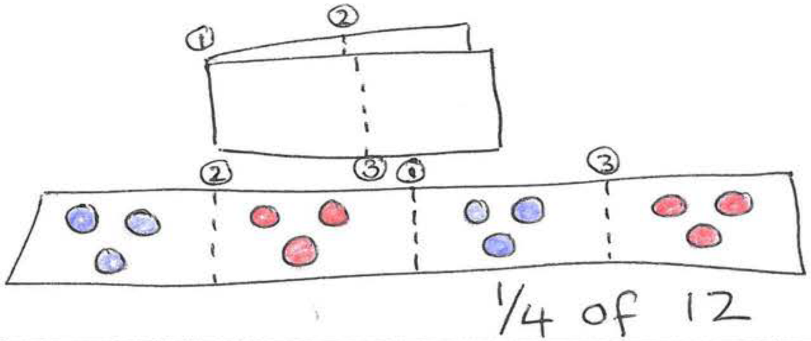
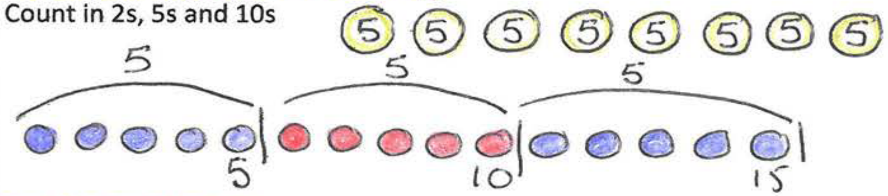
| x | 40 | 6 |
|---|---|---|
| 10 | 400 | 60 |
| 8 | 320 | 48 |
| | 720 | 108 |

= 828

| | Year 5 | Year 6 |
|---|---|---|
| **Mental Multiplication** | **Doubling and halving**<br>Double amounts of money using partitioning, *e.g. £6.73 doubled is double £6 (£12) plus double 73p (£1.46)*<br>£6.73<br>£12 £1.46<br>£13.46<br>Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20.<br>*E.g. 58 x 5 = ½ of 58 (29) X 10 (290)*<br>**Grouping**<br>Multiply decimals by 10, 100, 1000, *e.g. 3.4 x 100 = 340*<br>Use partitioning to multiply friendly 2-digit and 3-digit numbers by single-digit numbers.<br>*E.g. 402 x 6 as 400 x 6 (2400) and 2 x 6 (12)*<br>402<br>2400 12<br>2412<br>Use partitioning to multiply decimal numbers by single-digit numbers, *e.g. 4.5 x 3 as (4 x 3) + (4 x 0.5)*<br>Multiply using near multiples by rounding, *e.g. 32 x 29 as (32 x 30) – 32*<br>**Using number facts**<br>Use times tables facts up to 12 x 12 to multiply multiples of the multiplier, *e.g. 4 x 6 = 24 so 40 x 6 = 240 and 400 x 6 = 2400*<br>Know square numbers and cube numbers | **Doubling and halving**<br>Double decimal numbers with up to 2-places using partitioning, *e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46)*<br>36.73<br>72.00 1.46<br>73.46<br>Use doubling and halving as strategies in mental multiplication<br>**Grouping**<br>Use partitioning as a strategy in mental multiplication, as appropriate, *e.g. 3060 x 4 as (3000 x 4) + (60 x 4) or 8.4 x 8 as 8 x 8 (64) and 0.4 x 8 (3.2)*<br>Use factors in mental multiplication, *e.g. 421 x 6 as 421 x 3 (1263) doubled (2526) or 3.42 x 5 as half of (3.42 x 10)*<br>Multiply decimal numbers using near multiples by rounding, *e.g. 4.3 x 19 as 4.3 x 20 (86 – 4.3)*<br>**Using number facts**<br>Use times tables facts up to 12 x 12 in mental multiplication of large numbers or numbers with up to two decimal places, *e.g. 6 x 4 = 24 and 0.06 x 4 = 0.24* |
| **Written Multiplication** | Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers<br>3 8 7<br>x 6<br>2 3 2 2<br>5 4<br>Long multiplication of 2-digit, 3-digit and 4-digit numbers by teen numbers<br>3 8 7<br>x 1 4<br>1 5 4 8<br>3 8 7 0<br>5 4 1 8<br>1 1<br>Grid multiplication of numbers with up to 2 decimal places by single digit numbers<br>Multiplying fractions by single digit numbers<br>*E.g. ¾ x 6 = $^{18}/_{4}$ which is $4\,^{2}/_{4}$ = 4½*<br>**NB Grid multiplication provides a default method for ALL children** | Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers<br>3 8 7 5<br>x 6<br>2 3 2 5 0<br>5 4 3<br>Long multiplication of 2-digit, 3-digit and 4-digit numbers by 2-digit numbers<br>Short multiplication of decimal numbers using x100 and ÷100, e.g. 13.72 x 6 as 1372 x 6 ÷ 100<br>Short multiplication of money, £13.72 x 6<br>Grid multiplication of numbers with up to 2 decimal places by single digit numbers<br>Multiplying proper and improper fractions, e.g. ¾ x $^{2}/_{3}$<br>**NB Grid multiplication provides a default method for ALL children** |

| | Year | Mental calculation | Written Calculation | Minimum requirements for ALL children |
|---|---|---|---|---|
| *Division* | **Y1** | Begin to count in 2s, 5s and 10s<br>Find half of even numbers to 12 and know it is hard to halve odd numbers<br>Find half of even numbers by sharing<br>Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number. | | Begin to count in 2s and 10s<br>Find half of even numbers by sharing |
| | **Y2** | Count in 2s, 5s and 10s<br>Begin to count in 3s<br>Using fingers, say where a given number is in the 2s, 5s or 10s count. (E.g. 8 is the fourth number when I count in twos.)<br>Relate division to grouping. (E.g. how many groups of five in fifteen?)<br>Halve numbers to 20<br>Begin to halve numbers to 40 and multiples of 10 to 100<br>Find ½, $^{1}/_{3}$, ¼ and ¾ of a quantity of objects and of amounts (whole number answers) | To experience:<br>Perform divisions just above the $10^{th}$ multiple using the written layout and understanding how to give a remainder as a whole number.<br><br>*n.b. The are no statutory requirements for written calculations to be carried out at Key Stage 1* | Count in 2s, 5s and 10s<br>Say how many rows in a given array. (E.g. how many rows of 5 in an array of 3 x 5)<br>Halve numbers to 12<br>Find ½ of amounts |
| | **Y3** | Know by heart all the division facts derived from the 2x, 3x, 4x, 5x, 8x and 10x tables.<br>Divide whole numbers by 10 or 100 to give whole number answers<br>Recognise that division is not commutative.<br>Use place value and number facts in mental division. (E.g. 84 ÷ 4 is half of 42)<br>Divide larger numbers mentally by subtracting the tenth multiple, including those with remainders. (E.g. 57 ÷ 3 is 10 + 9 as 10x3=30 and 9x3=27)<br>Halve even numbers to 100, halve odd numbers to 20 | Perform divisions just above the $10^{th}$ multiple using the written layout and understanding how to give a remainder as a whole number.<br>Find unit fractions of quantities and begin to find non-unit fractions of quantities | Know by heart the division facts derived from the 2x, 3x, 5x and 10x tables<br>Halve even numbers up to 50 and multiples of ten to 100<br>Perform divisions within the tables including those with remainders, e.g. 38 ÷ 5. |
| | **Y4** | Know by heart all the division facts up to 144 ÷ 12.<br>Divide whole numbers by 10, 100 to give whole number answers or answers with one decimal place<br>Divide multiples of 100 by 1-digit numbers using division facts. (E.g. 3200 ÷ 8 = 400)<br>Use place value and number facts in mental division. (E.g. 245 ÷ 20 is double 245 ÷ 10 )<br>Divide larger numbers mentally by subtracting the $10^{th}$ or $20^{th}$ multiple as appropriate. (E.g. 156 ÷ 6 is 20 + 6 as 20x6=120 and 6x6=36)<br>Find halves of even numbers to 200 and beyond using partitioning<br>Begin to halve amounts of money. (E.g. Half of £52.40 = £26.20) | Use a written method to divide a 2-digit or a 3-digit number by a single-digit number.<br>Give remainders as whole numbers.<br>Begin to reduce fractions to their simplest forms.<br>Find unit and non-unit fractions of larger amounts. | Know by heart all the division facts up to 100 ÷ 10.<br>Divide whole numbers by 10 and 100 to give whole number answers or answers with one decimal place<br>Perform divisions just above the $10^{th}$ multiple using the written layout and understanding how to give a remainder as a whole number.<br>Find unit fractions of amounts |

| | | | | |
|---|---|---|---|---|
| | **Y5** | Know by heart all the division facts up to 144 ÷ 12.<br>Divide whole numbers by 10, 100, 1000, 10,000 to give whole number answers or answers with 1, 2 or 3 decimal places<br>Use doubling and halving as mental division strategies. (E.g. 34 ÷ 5 is (34 ÷ 10) x 2)<br>Use knowledge of multiples and factors, also tests for divisibility ,in mental division. (E.g. 246 ÷ 6 is 123 ÷ 3 and we know that 525 divides by 25 and by 3)<br>Halve amounts of money by partitioning. (E.g. Half of £75.40 = half of £75 (37.50) plus half of 40p (20p) which is £37.70)<br>Divide larger numbers mentally by subtracting the $10^{th}$ or $100^{th}$ multiple as appropriate. (E.g. 96 ÷ 6 is 10 + 6, as 10 × 6 = 60 and 6 × 6 = 36; 312 ÷ 3 is 100 + 4 as 100 x 3 = 300 and 4 x 3 = 12)<br>Reduce fractions to their simplest form. | Use short division to divide a number with up to 4 digits by a number ≤12.<br>Give remainders as whole numbers or as fractions.<br>Find non-unit fractions of large amounts.<br>Turn improper fractions into mixed numbers and vice versa.<br>Choose the most efficient method in any given situation | Know by heart division facts up to 121 ÷ 11<br>Divide whole numbers by 10, 100 or 1000 to give answers with up to one decimal place.<br>Use doubling and halving as mental division strategies<br>Use efficient chunking to divide numbers ≤ 1000 by 1-digit numbers.<br>Find unit fractions of 2 and 3-diigt numbers |
| | **Y6** | Know by heart all the division facts up to 144 ÷ 12.<br>Divide whole numbers by powers of 10 to give whole number answers or answers with up to three decimal places.<br>Identify common factors, common multiples and prime numbers and use factors in mental division. (E.g. 438 ÷ 6 is 219 ÷ 3 which is 73)<br>Use tests for divisibility to aid mental calculation.<br>Use doubling and halving as mental division strategies, e.g. to divide by 2, 4, 8, 5, 20 and 25. (E.g. 628 ÷ 8 is halved three times: 314, 157, 78.5)<br>Divide one and two place decimals by numbers up to and including 10 using place value. (E.g. 2.4 ÷ 6 = 0.4 or 0.65 ÷ 5 = 0.13, £6.33 ÷ 3 = £2.11)<br>Halve decimal numbers with up to 2 places using partitioning<br>*e.g. Half of 36·86 is half of 36 (18) plus half of 0·86 (0·43)*<br>Know and use equivalence between simple fractions, decimals and percentages, including in different contexts.<br>Recognise a given ratio and reduce a given ratio to its lowest terms. | Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number<br>Use long division to divide 3-digit and 4-digit numbers by 'friendly' 2-digit numbers.<br>Give remainders as whole numbers or as fractions or as decimals<br>Divide a one-place or a two-place decimal number by a number ≤ 12 using multiples of the divisors.<br>Divide proper fractions by whole numbers. | Know by heart all the division facts up to 144 ÷ 12.<br>Divide whole numbers by 10, 100, 1000 to give whole number answers or answers with up to two decimal places.<br>Use efficient chunking involving subtracting powers of 10 times the divisor to divide any number of up to 1000 by a number ≤ 12.<br>(E.g. 836 ÷ 11 as 836 – 770 (70x11) leaving 66 which is 6x11. So that we have 70 + 6 = 76 as the answer).<br>Divide a one-place decimal by a number ≤10 using place value and knowledge of division facts. |

| | Year 1 | Year 2 |
| --- | --- | --- |
| **Mental Division** | **Counting in steps ('Clever' counting)**<br>Count in 2s and 10s<br><br><br>**Doubling and halving**<br>Find half of even numbers up to 12 including realising that it is hard to halve an odd number<br><br><br>**Grouping**<br>Begin to use visual and concrete arrays and 'sets of' objects to find the answers to *'how many towers of 3 can I make with 12 cubes?'*<br><br>**Sharing**<br>Begin to find half of a quantity using sharing, *e.g. half of 16 cubes by giving one each repeatedly to two children*<br> | **Counting in steps ('Clever' counting)**<br>Count in 2s, 5s and 10s<br><br><br>**Doubling and halving**<br>Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a ½<br>Begin to know half of multiples of 10 to 100, *e.g. half of 70 is 35*<br><br>**Grouping**<br>Relate division to multiplication by using arrays or towers of cubes to find answers to division, *e.g. how many towers of five cubes can I make from 20 cubes as* $\square$ *x 5 = 20 and also as 20 ÷ 5 = ?*<br><br>Relate to division to 'clever' counting and hence to multiplication, *e.g. how many 5s do I count to get to 20?*<br><br>**Sharing** - Before Grouping<br>Begin to find half or a quarter of a quantity using sharing, *e.g. ¼ of 16 cubes by sorting the cubes into four piles*<br>Find ¼, ½, ¾ of small quantities<br><br>**Using number facts**<br>Know halves of even numbers to 24<br>Know 2x, 5x and 10x division facts<br>Begin to know 3x division facts |

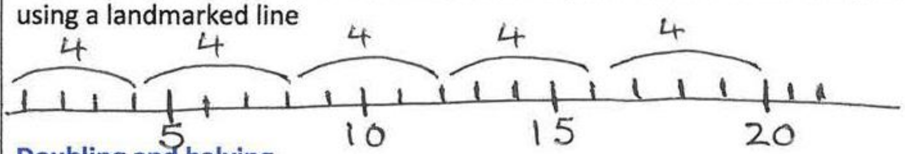
| | Year 3 | Year 4 |
|---|---|---|

## Mental Division

### Year 3

**Counting in steps ('Clever' counting)**

Count in 2s, 3s, 4s, 5s, 8s and 10s by colouring numbers on the 1-100 grid or using a landmarked line

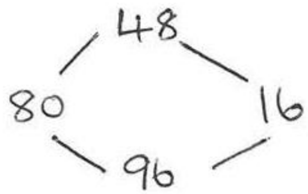



**Doubling and halving**

Find half of even numbers to 100 using partitioning.

Use halving as a strategy in dividing by 2.

*E.g. 36 ÷ 2 is half of 36*




**Grouping**

Recognise that division is not commutative, *e.g. 16 ÷ 8 does not equal 8 ÷ 16*

Relate division to multiplications 'with holes in', *e.g. □x 5 = 30 is the same calculation as 30 ÷ 5 = ? thus we can count in 5s to find the answer*

Divide multiples of 10 by single digit numbers, *e.g. 240 ÷ 8 = 30*

**Using number facts**

Know halves of even numbers to 40

Know halves of multiples of 10 to 200, *e.g. half of 170 is 85*

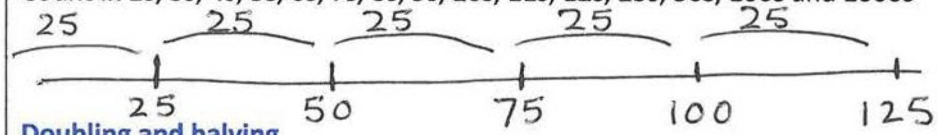
Know 2x, 3x, 4x, 5x, 8x, 10x division facts

Use division facts to find unit and simple non-unit fractions of amounts within the times tables, *e.g. ¾ of 48 is 3 x (48 ÷ 4)*

### Year 4

**Counting in steps – sequences**

Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s




**Doubling and halving**

Find halves of even numbers to 200 and beyond using partitioning.

Begin to half amounts of money.

*E.g. £9 halved is £4.50*

Use halving as a strategy in dividing by 2, 4 and 8, *e.g. 164 ÷ 4 is half of 164 (82) halved again (41)*

**Grouping**

Use multiples of 10 times the divisor to divide by number ≤9 above the tables facts, *e.g. 45 ÷ 3*

Divide multiples of 100 by single digit numbers using division facts, *e.g. 3200 ÷ 8 = 400*

45 ÷ 3 = □

□ x 3 = 45

10 x 3 = <u>30</u>

15

5 x 3 = 15

**Using number facts**

Know times tables up to 12 x 12 and all related division facts

Use division facts to find unit and non-unit fractions of amounts within the times tables, *e.g. ⁷/₈ of 56 is 7 x (56 ÷ 8)*

## Written Division

### Year 3

Expanded Chunking – Answers in teens

```
    1 4  r.1
4 | 5 7
  — 4 0 (10 x 4)
    1 7
  — 1 6 (4 x 4)
      1
```

### Year 4

Further Chunking

```
         2 2  r.4
1 4    3 1 2
   —   2 8 0  (20 x 14)
         3 2
   —     2 8  (2 x 14)
           4
```

| | Year 5 | Year 6 |
|---|---|---|
| **Mental Division** | **Doubling and halving**<br>Halve amounts of money using partitioning,<br>*e.g. half of £14.84 as half of £14 and half of 84p*<br>£14·84<br>£7 42p<br>£8·42p<br><br>Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20, *e.g. 115 ÷ 5 as double 115 (230) ÷ 10*<br><br>**Grouping**<br>Divide numbers by 10, 100, 1000 to obtain decimal answers with up to three places, *e.g. 340 ÷ 100 = 3.4.*<br>Use the 10th, 20th, 30th... multiple of the divisor to divide friendly 2-digit and 3-digit numbers by single-digit numbers, *e.g. 186 ÷ 6 as 30 x 6 (180) and 1 x 6 (6)*<br>Find unit & non-unit fractions of large amounts, *e.g.* $^{3}/_{5}$ *of 265 is 3 x (265 ÷ 5)*<br><br>**Using number facts**<br>Use division facts from the times tables up to 12 x 12 to divide multiples of powers of ten of the divisor, *e.g. 3600 ÷ 9 using 36 ÷ 9*<br>Know square numbers and cube numbers | **Doubling and halving**<br>Halve decimal numbers with up to 2-places using partitioning, *e.g. half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)*<br>£36·86<br>£18 43p<br>£18·43<br><br>Use doubling and halving as strategies in mental division, *e.g. 216 ÷ 4 is half of 216 (108) and half of 108 (54)*<br><br>**Grouping**<br>Use 10th, 20th, 30th, ... or 100th, 200th, 300th.... multiples of the divisor to divide large numbers, *e.g. 378 ÷ 9 as 40 x 9 = 360 and 2 x 9 = 18 so the answer is 42*<br>Use tests for divisibility, *e.g. 135 divides by 3 as 1 + 3 + 5 = 9 and 9 is in the 3x table*<br><br>**Using number facts**<br>Use division facts from the times tables up to 12 x 12 to divide decimal numbers by single-digit numbers, *e.g. 1.17 ÷ 3 is* $^{1}/_{100}$ *of 117 ÷ 3 (0.39)* |
| **Written Division** | Written version of a mental strategy for 3-digit ÷ 1 digit numbers<br><br>Short division of 3-digit and 4-digit numbers by single-digit numbers<br>1 2 6 4<br>$6\overline{)7\ {}^{1}5\ {}^{3}8\ {}^{2}4}$<br><br>Chunking – As Year 4 | Short division of 3-digit and 4-digit numbers by single-digit numbers<br>1 2 6 4<br>$6\overline{)7\ {}^{1}5\ {}^{3}8\ {}^{2}4}$<br><br>Long division of 3-digit and 4-digit numbers by two-digit numbers<br>2 5 1<br>$15\overline{)3765}$<br>3 0 0 0 (200 x 15)<br>7 6 5<br>7 5 0 (50 x 15)<br>1 5<br>1 5 (1 x 15)<br><br>Divide fractions by whole numbers, *e.g. ¼ ÷ 3 =* $^{1}/_{12}$ |