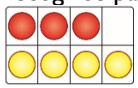
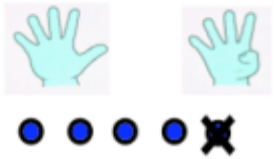
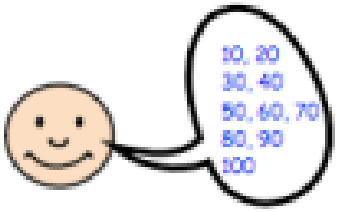
St. Joseph's Catholic
Infant & Junior Schools
Birtley

Calculation Policy

November 2022

BISHOP WILKINSON
CATHOLIC EDUCATION TRUST

Foundation Stage

Addition	Subtraction	Multiplication	Division
Begin to relate addition to combining two groups of objects - Make a record in pictures, words or symbols of addition activities already carried out. - Construct number sentences to go with practical activities - Use of games, songs and practical activities to begin using vocabulary. - Solve simple word problems using their fingers Can find one more to ten. Can use a part whole model to recongise parts. Can use counters in a tens frame to recognise parts.  Higher Ability/ Gifted and Talented children progress to using a number track They jump forwards along the number track using fingers. 1 2 3 4 5 6 7 8 9 10 	Begin to relate subtraction to 'taking away' - Make a record in pictures, words or symbols of subtraction activities already carried out. - Use of games, songs and practical activities to begin using vocabulary. - Construct number sentences to go with practical activities - Relate subtraction to taking away and counting how many objects are left.  Can find one less than up to ten. Higher Ability/ Gifted and Talented Progression: 1 2 3 4 5 6 7 8 9 10 Counting backwards along a number tracks using finger. 	Real life contexts and use of practical equipment to count in repeated groups of the same size: • Count in twos, fives and tens Also chanting in 2s, 5s and 10s. 	Share objects into equal groups Activities might include: - Sharing of milk at break time - Sharing sweets on a child's birthday - Sharing activities in the home corner - Count in tens/twos Separate a given number of objects into two groups. Link to repeated addition. Use related vocabulary Count in twos, tens How many times? How many are left/left over? Group Answer Right, wrong What could we try next? How did you work it out? Share out Half, halve

- If children are reaching a good level of development and are competent in the above strategies, then they will be extended to number sentences.

St. Joseph's Catholic Infant and Junior Schools, Birtley

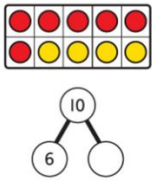
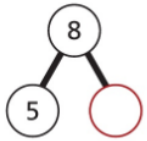
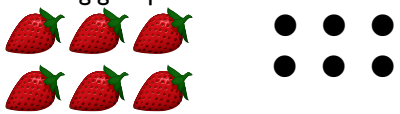
Year 1

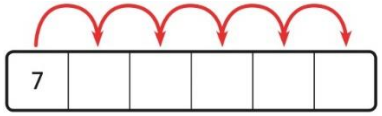
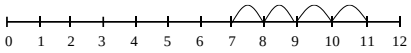
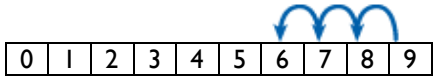
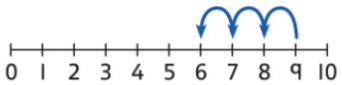
Addition and Subtraction - Pupils should be taught to:

- read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs;
- represent and use number bonds and related subtraction facts within 20.
- add and subtract one-digit and two-digit numbers to 20, including zero and
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9.

Multiplication and Division - Pupils should be taught to:

- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Addition	Subtraction	Multiplication	Division
Use a part-whole model alongside other representations to find number bonds.  Make sure to include examples where one of the parts is zero Missing numbers need to be placed in all possible places. Use of part whole model to scaffold this. 3 + 4 = □ □ = 3 + 4 3 + □ = 7 7 = □ + 4 □ + 4 = 7 7 = 3 + □ □ + ∇ = 7 7 = □ + ∇	Children use a part-whole model to support the subtraction to find a missing part.  *8 – 5 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model. 7 - 3 = □ □ = 7 - 3 7 - □ = 4 4 = □ - 3 □ - 3 = 4 4 = 7 - □ □ - ∇ = 4 4 = □ - ∇	Multiplication is related to doubling and counting groups of the same size.  Looking at columns 3 groups of 2 Looking at rows 2 groups of 3 Repeated addition can also be used to show multiplication. 2 + 2 + 2 3 + 3 Use Number tracks/lines to count in 2s, 5s, 10.s. 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 Counting using a variety of practical resources Counting in 2s e.g. counting socks, shoes, animal's legs…	Sharing – 6 sweets are shared between 2 people. How many do they have each?  6 shared by 2 is 3. Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc. **Grouping** Sorting objects into 2s / 3s/ 4s etc How many pairs of socks are there?  8 socks grouped into 2 is 4.

Written Method: **The Number Track/Line** Children use a numbered track, progressing to number line to count on in ones. Children use number lines and practical resources to support calculation and teachers *model* the use of the number track/line.  7 + 5 = ☐ 7+ 4  	-Understand subtraction as 'take away' Children count back to take away and use a number track or number line to support the method.   *9 − 3 = 6* Children understand subtraction as a difference. *9 − 3 = 6* *The difference between 9 and 6 is 3.* Find a 'difference' by counting up; I have 6p. I want to buy a toy for 9p. How much more do I need to save? Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences. Recording by - drawing jumps on prepared lines - constructing own lines	Counting in 5s e.g. counting fingers, fingers in gloves, toes… Counting in 10s e.g. fingers, toes… **Pictures / marks** There are 3 sweets in one bag. How many sweets are there in 5 bags?  3 lots of 5 is 15 3+3+3+3+3 = 15	

- If children are secure in end of year expectations and are ready to progress, x and ÷ can be introduced in Summer term of Y1, as per guidance from Non-Statutory guidance from Year 2 National Curriculum.

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Year 2

Addition and Subtraction - Pupils should be taught to:

- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures;
  - applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100;
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and that subtraction of one number from another cannot and
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

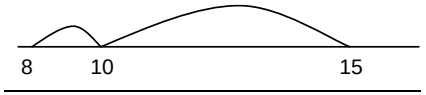
Multiplication and Division – Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers;
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs;
- show that multiplication of two numbers can be done in any order (commutative) and that division of one number by another cannot and
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Addition	Subtraction	Multiplication	Division
Continue using a range of equations as in Year 1 but with appropriate, larger numbers. Extend to 14 + 5 = 10 + □ **The Empty Number Line** Partitioning and bridging through 10. The steps in addition often bridge through a multiple of 10	Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to 14 + 5 = 20 - □ **Find a small difference by counting up** 42 – 39 = 3	**Arrays** ● ● ● ● ● ● ● ● Looking at columns 2 + 2 + 2 + 2 = 8 4 groups of 2 4 x 2 = 8 Looking at rows 4 + 4 = 8 2 groups of 4 2 x 4 = 8	**Repeated subtraction on a number line** There are 6 strawberries. How many people can have 2 each? How many 2s make 6? 6 ÷ 2 can be modelled as:

e.g.
Children should be able to partition the 7 to relate adding the 2 and then the 5.

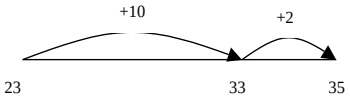
8 + 7 = 15



Add 9 by adding 10 and adjusting by 1
35 + 9 = 44

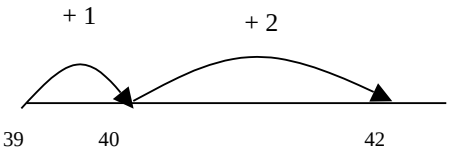
Addition through partitioning
e.g.
23+ 12=
20+ 10
3+2

Count on in tens and ones e.g.
23 + 12 = 23 + 10
= 33 + 2
= 35

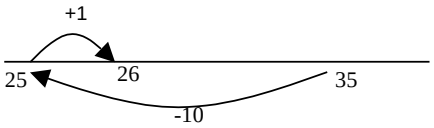


Children will begin to use formal methods alongside apparatus.

Although column method is not on the Y2 NC. It will be taught as a method if children are proficient in the above methods.



Subtract 9 or 11. Begin to add/subtract 19 or 21
35 – 9 = 26



25 27 37

Use known number facts and place value to subtract (partition second number only)
37 – 12 = 37 – 10 – 2
= 27 – 2
= 25

Bridge through 10 where necessary

32 – 17 = 15

Doubling by partitioning
Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways:
6 = 5 + 1 so
e.g. Double 6 is the same as double five add double one.

Double 5 = 10
Double 1 = 2 meaning
Double 6 = 10 + 2 = 12

Double multiples of 5 up to and including 50
e.g.

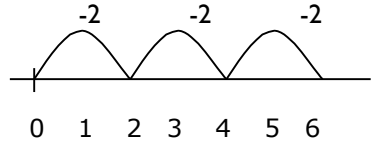
Double 15

10 + 5
↓ ↓
20 + 10 = 30

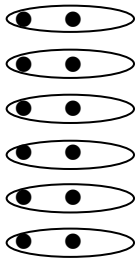
Children must learn their 2-, 5- and 10-times tables.

4s to be introduced once other multiplication facts are secure.

Mathematics National Curriculum States:
Pupils should work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).



Grouping/sharing:
12 ÷ 2 = 6

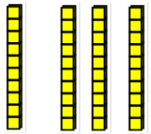
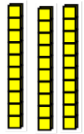
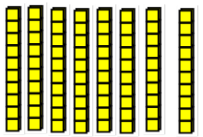
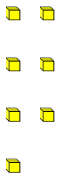


How many 2s can you make?

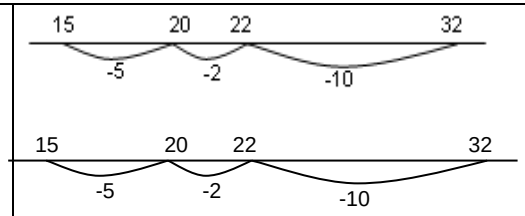
This should be taught through practical resources, tens and ones, without exchange, before moving onto an exchange.

Column method

53
+34
——

Tens	Ones
	
	
	

+



Children will begin to use formal methods of subtraction alongside apparatus.

Column method

TU
67
-24
43

See example of practical coloumn addiiton.

St. Joseph's Catholic Infant and Junior Schools, Birtley

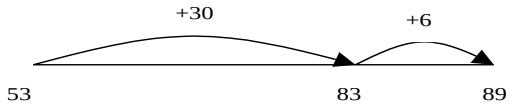
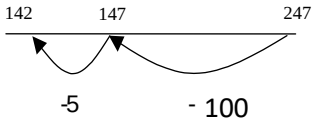
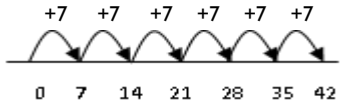
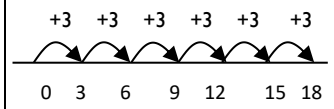
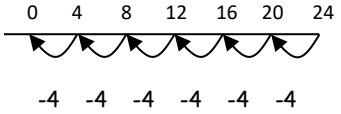
Year 3

Addition and Subtraction – Pupils should be taught to:

- add and subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction;
- estimate the answer to a calculation and use inverse operations to check answers and
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Multiplication and Division – Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables;
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods;
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Addition	Subtraction	Multiplication	Division
Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers. **Partition into tens and ones** • Partition both numbers and recombine. • Count on by partitioning the second number only e.g. 53+ 36= 53 + 30 + 6 = 83 + 6 = 89  	**Continue number lines with larger numbers.** 97-15 = 82  Number lines for three digit numbers, counting back. 247 – 105 = 142  	**Number line (repeated addition)** 6 x 7 = 42  Use of partitioning 26 x 5 20x 5 6 x 5	**Grouping using a number line (repeated addition)** 18 ÷ 3 = 6  **Grouping using a number line (repeated subtraction)** 24 ÷ 4 =6 

Add a near multiple of 10 to a two-digit number Secure mental methods by using a number line to model the method. Continue as in Year 2 but with appropriate numbers e.g. 35 + 19 is the same as 35 + 20 – 1. Children need to be secure adding multiples of 10 and 100 to any two-digit and 3-digit number including those that are not multiples of 10. 48 + 30 = 78 348+ 30 = 378 348+300=648 **Contracted column method** 358 + 73 431 11	When secure with this, children should progress towards the column subtraction method. Introduce this method using the appropriate column headings. TO HTO 95 239 -54 -125 41 114 Only when they are secure with their understanding of place value in the column subtraction method should they move onto problems where 'exchanging' from another column is necessary. TO HTO 7 1 3 1 ~~8~~ 2 ~~3~~ 4 3 -56 -125 26 218		**Use inverse of times tables knowledge** Children should use their knowledge of the times tables to calculate the inverse of division problems that have no remainder e.g. 27 ÷ 3 = 9 comes from knowing 3 x 9 = 27. **Use of partitioning- linking to non-standard partitioning** 84 ÷ 6 Partition 86 into 60 and 24. 60 ÷ 6 24 ÷ 6

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Year 4

Addition and Subtraction – Pupils should be taught to:

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation and
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Multiplication and Division – Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 × 12;
- use place value, known and derived facts to multiply and divide mentally, including:
    - multiplying by 0 and 1; dividing by 1; multiplying together three numbers;
    - recognise and use factor pairs and commutativity in mental calculations;
    - multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Addition	Subtraction	Multiplication	Division
Expanded column method HTU 474 +325 9 90 700 799 **Contracted column method** ThHTU 4 347 +2 452 6 799	If necessary, recap on the use of a number line for partitioned subtraction and subtraction by repeated addition. **Column method** HTU: 876 − 432 = 444 ThHTU: 4 968 − 2 713 = 2 255 **Column method with exchanging** Children should be taught that when they exchange 1 from the ten column to bring into their ones column, they are not just 'taking 1', they are actually exchanging 1 ten for 10 ones. Likewise	Children should be secure in their knowledge of times tables for recall up to and including 12 x 12. **Short Multiplication** 24 × 6 = 144 (2) 376 × 4 = 1504 (32) Understand how the expanded column method is related to the formal column method and understand how any exchanges are related to place value at each stage of the calculation.	**Continue with Y3 methods.** **Short Division-No remainder.** 96 ÷ 3 32 3 ⟌ 96 **Short Division- remainder** 75 ÷ 3 25 3 ⟌ 7¹5 No remainder as part of final total needed.

Contracted column method when carrying digits Before proceeding to this method, children must have a very secure understanding of all other additions methods prior to this. It should be taught that the children are 'exchanging' a digit into the next column. They are exchanging 10 multiples of the previous column e.g. 10 ones becomes an extra ten in that column, not just 'carrying' over 1. HTU 386 +495 881 11 ThHTU 2 593 + 3 648 6 241 Use of the column method should also be used to add decimals, ensuring decimals points are lined up. 0.3+1.2 0 . 3 + 1 . 2 1 . 5	when they exchange 1 from the thousands column, they are actually exchanging it for 10 hundreds. 5368 – 3295 = 2073 Th H T U 2 1 5 ~~3~~ 6 8 - 3 2 9 5 2 0 7 3 Subtraction of decimals as per the addition method.	2 3 × 5 1 5 1 0 0 1 1 5 2 3 × 5 1 1 5 1	

St. Joseph's Catholic Infant and Junior Schools, Birtley

Year 5

Addition and Subtraction – Pupils should be taught to:

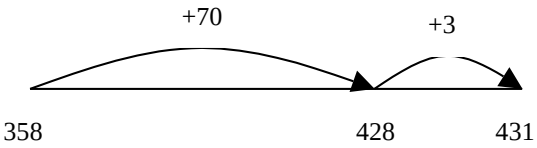
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction);
- add and subtract numbers mentally with increasingly large numbers;
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy and
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Multiplication and Division – Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers;
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers;
- establish whether a number up to 100 is prime and recall prime numbers up to 19;
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers;
- multiply and divide numbers mentally drawing upon known facts;
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context;
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000;
- recognise and use square numbers and cube numbers, and the notation for squared(^{2}) and cubed (^{3});
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes;
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign and
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

Addition	Subtraction	Multiplication	Division

Either partition both numbers and recombine or partition the second number only e.g.
358 + 73 = 358 + 70 + 3
= 428 + 3
= 431



Column addition

Extend to numbers with at least four digits
3587 + 675 = 4262

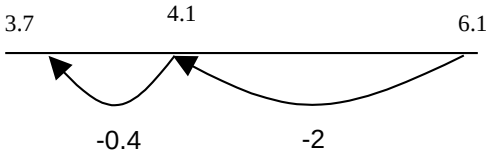
```
  3587
+  675
  4262
  111
```

Revert to expanded method from Year 4 if the children experience any difficulty.

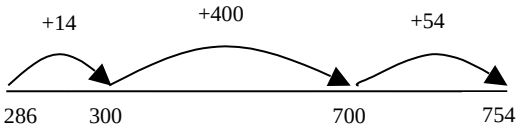
Adding Decimals
Link measure with addition of decimals.

Two lengths of fencing are 0·6 m and 0·2 m.
How long are they when added together?

Use known number facts and place value to subtract
6.1 – 2.4 = 3.7



Complementary addition
754 – 286 = 468



Column subtraction

Children should be taught that when they 'borrow' 1 from the ten column to bring into their units column, they are not just 'taking 1', they are actually exchanging 1 ten for 10 units. Likewise, when they 'borrow' 1 from the thousands column, they are actually exchanging it for 10 hundreds
5368 – 3295 = 2073

```
 Th H  T  U
     2 1
  5  3  6  8
- 3  2  9  5
  2  0  7  3
```

Column subtraction with decimals

Expanded Column Multiplication

The first step in 38 × 7 is 'thirty multiplied by seven', not 'three times seven', although the relationship 3 × 7 should be stressed.

```
  23
X  8
 160   (20 x 8)
  24   (3 x 8)
 184
```

```
  63
X  9
 540   (60 x 9)
  27   (3 x 9)
 567
```

Short multiplication

```
   6 3
 X 9
 5 6 7
   2
```

```
   2 8 4 9
 X       7
 1 9 7 4 3
   5 3 6
```

Long multiplication

```
   2 6
 X3 4
```

Short Division

386 ÷ 7 = 55 r 1

```
      0 5 5 r 1
   ┌──────────
 7 │ 3 8 6
```

4528 ÷ 9 = 503 r 1

```
      0 5 0 3  r 1
   ┌──────────
 9 │ 4 5 2 8
```

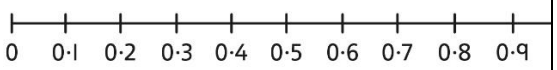
Introduce the concept of the remainder being a fraction e.g.
55 r 1 = 55 1/7
However, this should remain appropriate to the context.

Understanding the relationship between fractions and division
Use the link between division and fractions to calculate divisions.

$5 \div 4 = \frac{5}{4} = 1\frac{1}{4}$

$11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$

Use a number line to add tenths.



0·6 + 0·2 = 0·8
6 tenths + 2 tenths = 8 tenths

Understand the link with adding fractions.

$$\frac{6}{10}+\frac{2}{10}=\frac{8}{10}$$

6 tenths + 2 tenths = 8 tenths

0·6 + 0·2 = 0·8

Column addition with decimals
Extend to up to two places of decimals (same number of decimals places) and adding several numbers (with different numbers of digits).

```
  72.8
+54.6
127.4
 1  1
```

Use a place value grid to represent the stages of column subtraction, including exchanges where required.

5·74 − 2·25 = ?

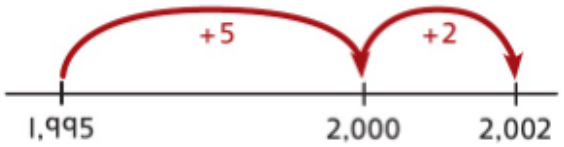
Extend to up to two places of decimals (same number of decimals places).

9467.25 – 5395.17 = 4072.08

```
   3 1   1 1
   9 4 6 7 . 2 5
-  5 3 9 5 . 1 7
   4 0 7 2 . 0 8
```

Choosing an efficient method
To subtract two large numbers that are close, children find the difference by counting on.

2,002 − 1,995 = ?



Use addition to check subtractions.

I calculated 7,546 − 2,355 = 5,191.
I will check using the inverse.

```
  1 0 4
  7 8 0
  8 8 4


    2 8 6
  x   2 9
  2 5 7 4    (9 x 286 = 2574)
  5 7 2 0    (20 x 286 = 5720)
  8 2 9 4
  1
```

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Year 6

Addition, Subtraction, Multiplication and Division – Pupils should be taught to:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication;
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context;
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context;
- perform mental calculations, including with mixed operations and large numbers;
- identify common factors, common multiples and prime numbers;
- use their knowledge of the order of operations to carry out calculations involving the four operations;
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why;
- solve problems involving addition, subtraction, multiplication and division and
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Addition	Subtraction	Multiplication	Division
Column addition By this stage, children should be confident with the column addition of any number of digits to any number of decimal places. 67569.356 + 235729.905 = 303299.261 67569.356 +235729.905 303299.261 1111 11 1	**Column subtraction** By this stage, children should be confident with the column subtraction of any number of digits to any number of decimal places. 224.90 – 117.25 = 107.65 1 1 8 1 2 2 4 . 9 0 - 1 1 7 . 2 5 1 0 7 . 6 5 9467.26 - 5395.17 = 4072.08 3 1 1 9 4 6 7 2 5 - 5 3 9 5 . 1 7 4 0 7 2 . 0 8	**Long multiplication** 54 x 257 = 13878 54 x257 378 2700 10800 13878 1 **Short multiplication** 4983 x 9 = 44847 4983 X 9 44847 872	**Long division** 432 ÷ 15 = 28.8 28.8 15 | 432.0 30 (20 x 15) 132 120 (8 x 15) 120 120 (0.8 x 15) 0 **Short division** 64528 ÷ 9 = 7189 r 7 **OR** 7189 7/9 07189r7 9 | 64528

		Multiplying Decimals Use known facts to multiply decimals. *4 × 3 = 12* *4 × 0·3 = 1·2* *4 × 0·03 = 0·12* *20 × 5 = 100* *20 × 0·5 = 10* *20 × 0·05 = 1*	**Dividing Decimals** Use short division to divide decimals with up to 2 decimal places. 8 ⟌ 4 · 2 4 0 · 8 ⟌ 4 · ^{4}2 4 0 · 5 8 ⟌ 4 · ^{4}2 ^{2}4 0 · 5 3 8 ⟌ 4 · ^{4}2 ^{2}4

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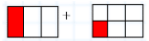
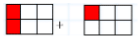
Fraction Addition

Add proper fractions



$\frac{1}{3} + \frac{1}{6}$

1) Convert both fractions to have the same denominator
2) Add the numerators, but not the denominators.
3) Simplify the answer if you can



$\frac{2}{6} + \frac{1}{6}$

$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$

$\frac{3}{6} = \frac{1}{2}$

Add mixed numbers (method 1) $1\frac{3}{4} + 1\frac{3}{8}$

1) Change any mixed numbers to improper fractions. $\frac{7}{4} + \frac{11}{8}$
2) Convert both fractions to have the same denominator $\frac{14}{8} + \frac{11}{8}$
3) Add the numerators together. $\frac{14}{8} + \frac{11}{8} = \frac{25}{8}$
4) Change any improper fractions back to mixed numbers $\frac{25}{8} = 3\frac{1}{8}$
5) Simplify the answer if you can.

Add mixed numbers (method 2) $1\frac{3}{4} + 1\frac{3}{8}$

1) Add the two whole numbers together. $1 + 1 = 2$
2) Convert both fractions to have the same denominator. $\frac{6}{8} + \frac{3}{8}$
3) Add the numerators together. $\frac{6}{8} + \frac{3}{8} = \frac{9}{8}$
4) Change any improper fractions back to mixed numbers $\frac{9}{8} = 1\frac{1}{8}$
5) Add together your two answers. $2 + 1\frac{1}{8} = 3\frac{1}{8}$
6) Simplify the answer if you can.

Fraction Subtraction

Subtract proper fractions

$\frac{2}{3} - \frac{1}{6}$

1) Convert both fractions to have the same denominator
2) Subtract the numerators, but not the denominators.
3) Simplify the answer if you can

$\frac{4}{6} - \frac{1}{6}$

$\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$

$\frac{3}{6} = \frac{1}{2}$

Subtract mixed numbers $2\frac{3}{4} - 1\frac{1}{8}$

1) Change any mixed numbers to improper fractions. $\frac{11}{4} - \frac{9}{8}$
2) Convert both fractions to have the same denominator. $\frac{22}{8} - \frac{9}{8}$
3) Subtract the second numerator from the first. $\frac{22}{8} - \frac{9}{8} = \frac{13}{8}$
4) Change any improper fractions back to mixed numbers. $\frac{13}{8} = 1\frac{5}{8}$
5) Simplify the answer if you can.

Fraction Multiplication

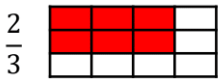
Multiply pairs of proper fractions $\frac{3}{4} \times \frac{2}{3}$

1) Multiply the numerators
2) Multiply the denominators
3) Simplify the answer if you can.

$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$

$\frac{6}{12} = \frac{1}{2}$

$\frac{3}{4}$



$\frac{2}{3}$

$= \frac{6}{12}$

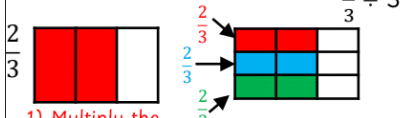
Multiply fractions by whole numbers

$\frac{3}{4} \times 5$

1) Write the whole number as a fraction over 1. $\frac{3}{4} \times \frac{5}{1}$
2) Multiply the numerators
3) Multiply the denominators $\frac{3}{4} \times \frac{5}{1} = \frac{15}{4}$
4) Change any improper fractions back to mixed numbers $\frac{15}{4} = 3\frac{3}{4}$
5) Simplify the answer if you can

Fraction Division

Divide fractions by whole numbers $\frac{2}{3} \div 3$



1) Multiply the denominator by the whole number and write the answer as the new denominator.
2) Simplify the answer if you can.

$\frac{2}{3} \div 3 = \frac{2}{9}$