St. Peter's Catholic Primary School

part of the wider Christus Trust, Multi Academy Trust

Mission Statement

Loving and learning together, with Jesus

Calculation Policy

Policy Ref No	CUR012
Date of Policy	March 2024
Review date	March 2027

Mathematics Intent

In Mathematics, we develop the children's Knowledge and Skills in line with the school's vision for a Knowledge and Skills based curriculum.

We inspire Creativity through thought-provoking concepts and variation which encourages our pupils to think creatively.
We encourage Discovery through posing problems that we solve with our peers to gain greater understanding and independently to consolidate our understanding.
We foster a Curiosity by encouraging our children to think differently and from different perspectives.
We develop Independence through carefully designed learning in maths to equip pupils with the skills needed to succeed.
We instil Resilience through our mastery approach to maths, continually challenging all pupils.
As a result the children Respect and Value mathematics and become Lifelong learners.

Purpose

At St Peter's, we believe that every child can achieve excellence. To effectively measure children's achievement (attainment and progress), it is important that accurate and consistent methods for calculation are in place. This policy outlines the guidelines that are followed at St Peter's Catholic Primary School.

Monitoring and Evaluation of the Policy

This policy is a practical working document for the teaching of calculation throughout the school. The policy will be regularly monitored and any necessary changes will be reported to the LGC.

ADDITION GUIDELINES

Stage One

Prerequisite skills (based on the practical)
Counting numbers to 20

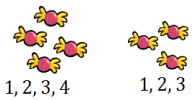
(using familiar / practical resources)

Place numbers to 20 in order

Bonds up to 10 and to make 10

1 more than a number

Addition as combining groups



1, 2, 3, 4, 5, 6, 7

Addition as counting on

Stage Two

Prerequisite skills (based on the practical)

Relate number bonds to 10 to add multiples of 10 up to a total of 100 e.g. if 3 + 4 is 7 then 30 + 40 is 70

Use familiar objects to recognise the place value of 2 digit numbers.

Recognise and explain 24 is '2 tens and 4 ones'

Progressing to: **PARTITIONING AND RECOMBINING**
Partition into tens and ones and recombine
Pre J10 (before jumping in 10s)

12 + 23 = 10 + 2 + 20 + 3
= 30 + 5
= 35

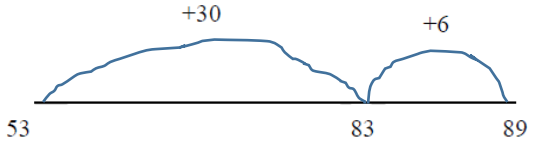
Model this on an abacus and practise on 100-beadstrings, showing the 'collection' of 10s and then the ones. i.e. "2 tens and 1 ten makes 3 tens, which is 30. Then 3 and 2 makes 5 ones. Altogether we can see 3 tens and 5 ones, which is 35." Check by counting in tens and ones along the abacus. Model

Stage Three (low)

+ = signs and missing numbers
Continue using a range of equations as in Stages 1 and 2 but with appropriate, larger numbers.

Partition into tens and ones and recombine
Partition both numbers and recombine. Refine to partitioning the second number only e.g.

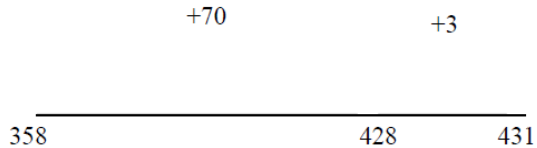
36 + 53 = 53 + 30 + 6
= 83 + 6
= 89



Add a near multiple of 10 to a two-digit number
Continue as in Stage 2 but with appropriate numbers e.g. 35 + 19 is the same as 35 + 20 – 1.

Partition into hundreds, tens and ones and recombine
Either partition both numbers and recombine, or partition the second number only e.g.

358 + 73 = 358 + 70 + 3
= 428 + 3
= 431



ADDITION GUIDELINES

Stage One


Doubling numbers within 20

Number bonds to 20

+ / = signs and missing numbers/symbols

Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equal sign so that the sign is not just interpreted as 'the answer'.

2 = 1+ 1
2 + 3 = 4 + 1
3 = 3
2 + 2 + 2 = 4 + 2

Missing numbers need to be placed in all possible places.

3 + 4 = □	□ = 3 + 4
3 + □ = 7	7 = □ + 4
□ + 4 = 7	7 = 3 + □
□ + ∇ = 7	7 = □ + ∇

The Number Line

Children use a numbered line to count on in ones. Children use number lines and practical resources to

Stage Two

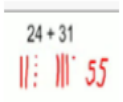
and practise with place value arrow cards, numicon, bead strings or Dienes, using known facts and place value to calculate each step.

+ = signs and missing numbers

Continue using a range of equations as Stage 1 but with appropriate, larger numbers.

Extend to:
14 + 5 = 10 + □
and adding three numbers:
32 + □ + □ = 100 35 = 1 + □ + 5

Partition using sticks and dots



Partition into tens and ones and recombine

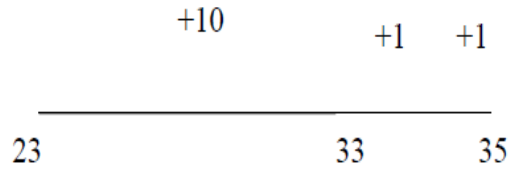
12 + 23 = 10 + 2 + 20 + 3
= 30 + 5
= 35

Also: 12 + 23

10 + 20 + 2 + 3 = 30 +5 = 35

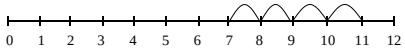
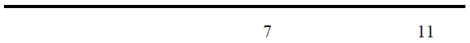
refine to partitioning the second number only:

23 + 12 = 23 + 10 +1 + 1
= 33 + 1 + 1
= 35



Stage Three (low)

ADDITION GUIDELINES

Stage One	Stage Two	Stage Three (low)
support calculation and teachers *model* the use of the number line. e.g. 7+ 4:  Progress from numbered lines to blank number lines. 7 + 4 = 11  ***Number line Teaching Points:*** ***Always work with numbers reading from left to right (smallest to largest), whatever the operation of the calculation.*** ***Numbers ('landmarks') are written below the line.*** ***Size of the 'jumps' are written above the 'jumps'.***	 **Mental Method** *Add 9 or 11 by adding 10 and adjusting by 1* 35 + 9 = 44  	

ADDITION GUIDELINES

Stage Three (secure)

Pencil and paper procedures

83 + 42 = 125

Progress to units first:

$$\begin{array}{r} 80 + 3 \\ +\ 40 + 2 \\ \hline 120 + 5 = 125 \end{array}$$

to

$$\begin{array}{r} 8\ 3 \\ +\ 4\ 2 \\ \hline 5 \\ 120 \\ \hline \mathbf{125} \end{array}$$

358 + 73 = 431

either

$$\begin{array}{r} 300 + 50 + 8 \\ +\quad 70 + 3 \\ \hline 300 + 120 + 11 = 431 \end{array}$$

or

$$\begin{array}{r} 358 \\ 73 \\ \hline 11 \\ 120 \\ 300 \\ \hline 431 \end{array}$$

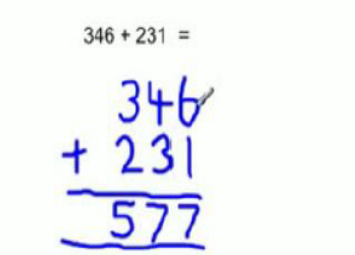
Stage Four

Pencil and paper procedures

Lead to formal method, showing numbers carried underneath:

$$\begin{array}{r} 358 \\ +\ 73 \\ \hline 431 \\ {\scriptstyle 1\ 1} \end{array}$$

346 + 231 =

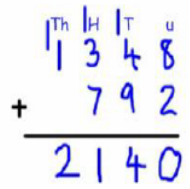


Extend to numbers with at least four digits:

3587 + 675 = 4262

$$\begin{array}{r} 3587 \\ +\ 675 \\ \hline 4262 \\ {\scriptstyle 1\ 1\ 1} \end{array}$$

1348 + 792



Extend to decimals (same number of decimal places) and adding several numbers (with different numbers of digits).
Model negative numbers using a number line.

Stage Five

Pencil and paper procedures

Extend to numbers with any number of digits and decimals with 1 and 2 decimal places:

124.9 + 117.25 = 242.15

$$\begin{array}{r} 124.90 \\ +\ 117.25 \\ \hline 242.15 \\ {\scriptstyle 1\ 1} \end{array}$$

include a zero to keep the place value

346 + 231 = 300 + 40 + 6 + 200 + 30 + 1 500 + 70 + 7	Working from <u>right to left</u>: "7 + 6 is 13. Partition the 13 into 10 and 3, 'carry' the ten into the tens column, writing it as 1 to represent one ten." **Children encouraged to say 'carry the ten' not 'carry the 1.'**	

End of year expectations for Addition

EYFS	Year 1	Year 2	Year 3
Numbers: children count reliably with numbers from 1 to 20, place them in order and say which number is one more than a given number. Using quantities and objects, they add two single-digit numbers and count on to find the answer.	• Read, write and interpret mathematical statements involving addition (+),and equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • Add one-digit and two-digit numbers to 20, including zero *(using concrete objects and pictorial representations)* Solve one-step problems that involve addition a, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ +2	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • Recall and use addition facts to 20 fluently, and derive and use related facts up to 100 • *Recall and use number bonds for multiples of 5 totalling 60 (to support telling time to nearest 5 minutes)* • Add 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 • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems Solve problems with addition *including with missing numbers:* - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Understand and use take away and difference for subtraction, deciding on the most efficient method for the numbers involved, irrespective of context* • *Recall/use addition facts for 100 (multiples of 5 and 10)* • *Derive and use addition facts for 100* • *Derive and use addition facts for multiples of 100 totalling 1000* • Add and numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds • Add 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 Solve problems, including missing number problems, using number facts, place value, and more complex addition

End of year expectations for Addition		
Year 4	**Year 5**	**Year 6**
• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Recall and use addition facts for 100* • *Recall and use + facts for multiples of 100 totalling 1000* • *Derive and use addition facts for 1 and 10 (with decimal numbers to one decimal place)* • *Add mentally combinations of two and three digit numbers and decimals to one decimal place* • Add numbers with up to 4 digits *and decimals with one decimal place* using the formal written methods of columnar addition where appropriate • Estimate; use inverse operations to check answers to a calculation • Solve addition two-step problems in contexts, deciding which operations and methods to use and why *Solve addition problems involving missing numbers*	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Recall and use addition facts for 1 and 10 (with decimal numbers to one decimal place)* • *Derive and use addition facts for 1 (with decimal numbers to two decimal places)* • Add numbers mentally with increasingly large numbers *and decimals to two decimal places* • Add whole numbers with more than 4 digits *and decimals with two decimal places,* including using formal written methods (columnar addition) • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition multi-step problems in contexts, deciding which operations and methods to use and why *Solve addition problems involving missing numbers*	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers in the calculation* • *Recall and use addition facts for 1 (with decimals to two decimal places)* • Perform mental calculations including with mixed operations and large numbers *and decimals* • *Add whole numbers and decimals using formal written methods (columnar addition)* • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations • Solve addition multi-step problems in contexts, deciding which operations and methods to use and why Solve problems involving all four operations, *including those with missing numbers*

SUBTRACTION GUIDELINES

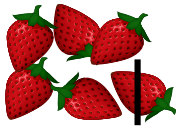
Stage One

Prerequisite skills (based on the practical)
Number bonds to 10

Counting back from 20

Find one less than a given number

Subtract using quantities and objects 2 single digit numbers



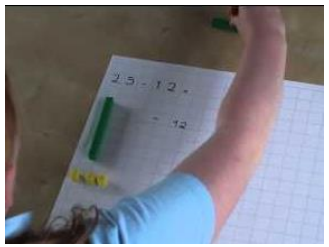
Count back to subtract single digit numbers

There are two concepts linked to subtraction:
Subtract - where it is natural to count back to 'take away'
Find the difference – where the understanding of the vocabulary leads to using addition to count on [complementary addition].

Understand subtraction as 'take away'

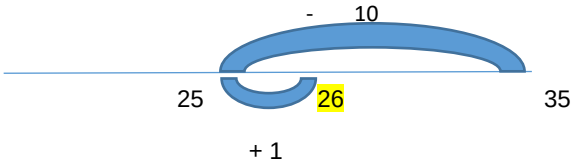
Stage Two

Using dienes to subtract. Pupils to draw representations:



Teaching mental strategies including numbers close to multiples of ten (e.g. s*ubtracting 9 or 11. Begin to add/subtract 19 or 21).*

Rounding and compensating
35 – 9 = 26



Stage Three (low)

Find a small difference by counting up

Continue as Stage2 but with appropriate numbers e.g. 102 – 97 = 5

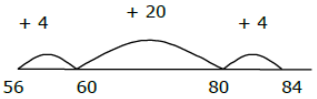
Use known number facts and place value to subtract

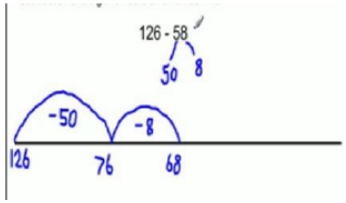
Continue as in Stage2 but with appropriate numbers e.g. 3 digit number – 2 digit number:

197 – 15 = 182

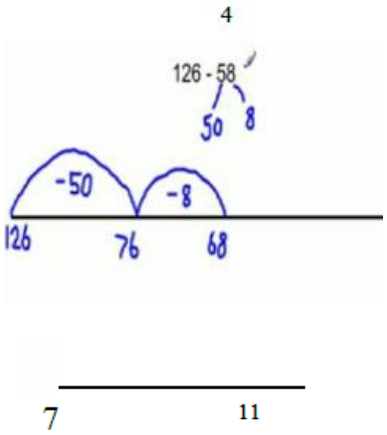
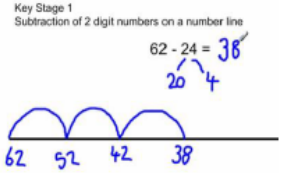
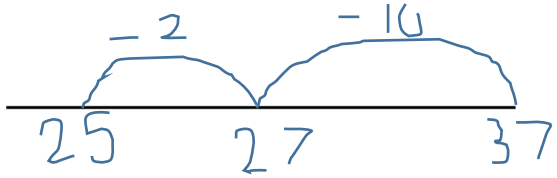
Pencil and paper procedures
Complementary addition:

84 – 56 = 28





SUBTRACTION GUIDELINES

Stage One	Stage Two	Stage Three (low)
- = signs and missing numbers 7 - 3 = □ □ = 7 - 3 7 - □ = 4 4 = □ - 3 □ - 3 = 4 4 = 7 - □ □ - ∇ = 4 4 = □ - ∇ **Number lines (labelled and blank number lines)**  	**Use known number facts and place value to subtract** (partition second number only) 37 – 12 = 37 – 10 – 2 = 27 – 2 = 25  	

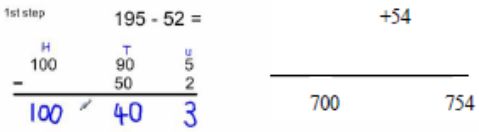
SUBTRACTION GUIDELINES

Stage Three (secure)	Stage Four	Stage Five

Pencil and paper procedures

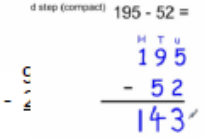
Complementary addition:

754 – 86 = 668



195 - 52 =

	H	T	u
	100	90	5
−		50	2
	100	40	3



70 (90-20)
74

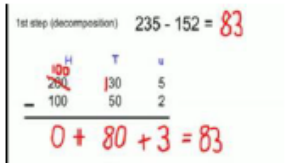
→

Use expanded method as an introduction to decomposition:

90 2 − 30 8

80 12 − 30 8

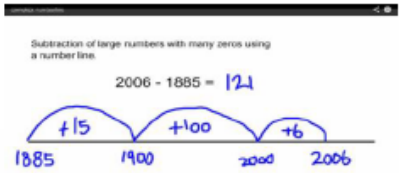
50 + 4 = 54



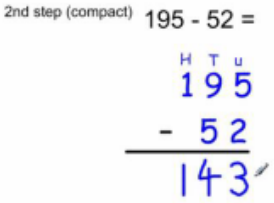
Find a difference by counting up:

e.g. 2006 – 1885 = 121

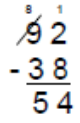
This can be modelled on an empty number line



Second Step (compact)

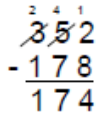


Pencil and paper procedures

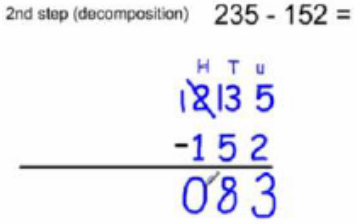


Pencil and paper procedures

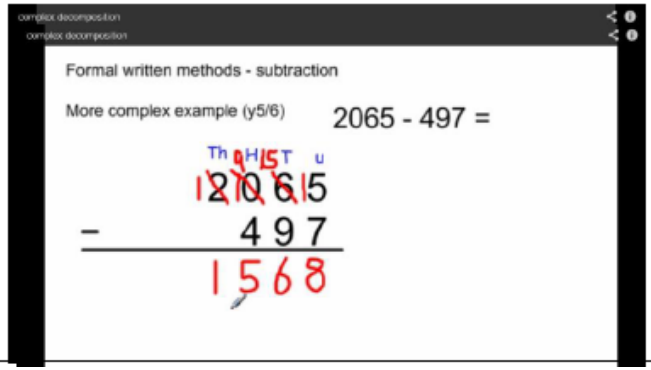
Use decomposition



Extend to decomposition using '0' as a place holder



Extend to numbers with any number of digits and decimals with 1 and 2 decimal places:



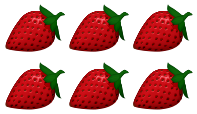
End of year expectations Subtraction			
EYFS	**Year 1**	**Year 2**	**Year 3**
Numbers: children count reliably with numbers from 1 to 20, place them in order and say which number is one less than a given number. Using quantities and objects, they subtract two single-digit numbers and count on or back to find the answer.	• Read, write and interpret mathematical statements involving , subtraction (-) and equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • subtract one-digit and two-digit numbers to 20, including zero *(using concrete objects and pictorial representations)* Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ - 9	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • *Understand subtraction as take away and difference (how many more, how many less/fewer)* • Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 • *Recall and use number bonds for multiples of 5 totalling 60 (to support telling time to nearest 5 minutes)* • 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 • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems Solve problems with subtraction *including with missing numbers:* - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Understand and use take away and difference for subtraction, deciding on the most efficient method for the numbers involved, irrespective of context* • *Recall/use subtraction facts for 100 (multiples of 5 and 10)* • *Derive and use subtraction facts for 100* • *Derive and use subtraction facts for multiples of 100 totalling 1000* • subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds • subtract numbers with up to three digits, using formal written methods of columnar subtraction • Estimate the answer to a calculation and use inverse operations to check answers Solve problems, including missing number problems, using number facts, place value, and more complex subtraction

End of year expectations for Subtraction		
Year 4	**Year 5**	**Year 6**
• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Recall and use subtraction facts for 100* • *Recall and use - facts for multiples of 100 totalling 1000* • *Derive and use subtraction facts for 1 and 10 (with decimal numbers to one decimal place)* • *subtract mentally combinations of two and three digit numbers and decimals to one decimal place* • subtract numbers with up to 4 digits *and decimals with one decimal place* using the formal written methods of columnar subtraction where appropriate • Estimate; use inverse operations to check answers to a calculation • Solve subtraction two-step problems in contexts, deciding which operations and methods to use and why *Solve subtraction problems involving missing numbers*	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers involved in the calculation* • *Recall and use subtraction facts for 1 and 10 (with decimal numbers to one decimal place)* • *Derive and use subtraction facts for 1 (with decimal numbers to two decimal places)* • subtract numbers mentally with increasingly large numbers *and decimals to two decimal places* • subtract whole numbers with more than 4 digits *and decimals with two decimal places,* including using formal written methods (columnar addition and subtraction) • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why *Solve subtraction problems involving missing numbers*	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Select a mental strategy appropriate for the numbers in the calculation* • *Recall and use subtraction facts for 1 (with decimals to two decimal places)* • Perform mental calculations including with mixed operations and large numbers *and decimals* • *subtract whole numbers and decimals using formal written methods (columnar addition and subtraction)* • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations • Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve problems involving all four operations, *including those with missing numbers*

MULTIPLICATION GUIDELINES

Stage One

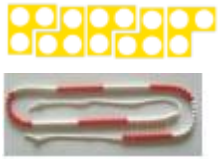
Prerequisite skills (based on the practical)
Multiplication is related to known facts including doubling and counting groups of the same size.



3 + 3

E.g. use of dominoes and dice.

Counting using a variety of practical resources



Numicon and bead strings

Counting in 2s e.g. counting socks, shoes, animal's legs…

Counting in 5s e.g. counting fingers, fingers in gloves, toes…

Counting in 10s e.g. fingers, toes…

Pictures / marks
There are 2 socks in a pair
How many socks are there in 3 pairs?

Stage Two

x = signs and missing numbers

7 x 2 = □	□ = 2 x 7
7 x □ = 14	14 = □ x 7
□ x 2 = 14	14 = 2 x □
□ x ∇ = 14	14 = □ x ∇

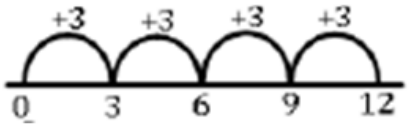
Arrays and repeated addition

Looking at rows
3 + 3
2 groups of 3

Looking at rows
2 + 2 + 2
3 groups of 2

3 x 2 or 3 + 3

2 +2 + 2 or 2 x 3



If the calculation is 3 x 4 for example, children should understand that this means 3 + 3 + 3 + 3. Children should also understand the commutative law and be able to use 4 x 3.

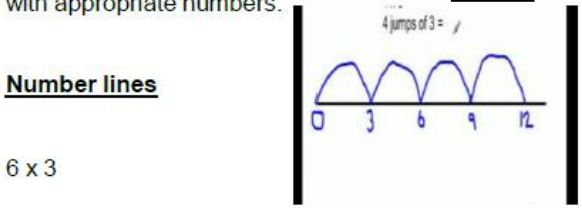
Stage Three (low)

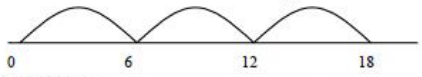
x = signs and missing numbers

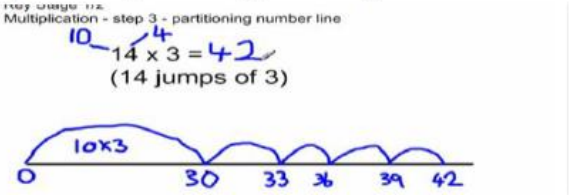
Continue using a range of equations as in Stage2 but with appropriate numbers.

Number lines

6 x 3







Partition
35 x 2 = 70

x	30	5
2	60	10

60 + 10 = 70

MULTIPLICATION GUIDELINES		
Stage One	**Stage Two**	**Stage Three (low)**
Pictures and symbols There are 3 sweets in one bag. How many sweets are there in 5 bags?  *(Recording on a number line modelled by the teacher when solving problems)* Use of bead strings to model groups of:		

MULTIPLICATION GUIDELINES

Stage Three (secure)

x = signs and missing numbers

Continue using a range of equations as in Stage2 but with appropriate numbers

Pencil and paper procedures

Grid method

17 x 4 =

	10	7
4	40	28

17 X 4

TU x U

40
+ 28
68

23 x 7 is approximately 20 x 10 = 200
23 x 7 = 161

x	T 20	U 3
7	140	21

140 + 21 = 161

HTU x U

123 x 3 = 369

X	H 100	T 20	U 3
3	300	60	9

300 + 60 + 9 = 369

Stage Four

x = signs and missing numbers

Continue using a range of equations as in Stage2 but with appropriate numbers

Pencil and paper procedures

Grid method:

TU x TU

72 x 38 is approximately 70 x 40 = 2800
72 x 38 = 2736

x	70	2
30	2100	60
8	560	16

= 2160
+ 576
2736

Estimate and check.

1125 x 7 = 7875

	TH	H	T	U
	1000	100	20	5
7	7000	700	140	35

Stage Five

x = signs and missing numbers

Continue using a range of equations as in Stage2 but with appropriate numbers

Pencil and paper procedures

Grid method
Estimate and check

372 x 24 is approximately 400 x 20 = 8000

x	300	70	2	
20	6000	1400	40	= 7440
4	1200	280	8	= 1488 +
				8928

Progress to formal method of x (see end of page)

Grid method for decimals

7.2 x 3.8

x	7	0.2	
3	21	0.6	= 21.60
0.8	5.6	0.16	= 5.76 +
			27.36
			1

Formal column method

372 x 24

```
  372
   24 x
 1488
 7440
 8928
```

End of year expectations for multiplication

EYF	Year 1	Year 2	Year 3
They solve problems, including doubling,.	• *Recall and use doubles of all numbers to 10 and corresponding halves* • Solve one-step problems involving multiplication , by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• *Understand multiplication as repeated addition* • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • *Derive and use doubles of simple two-digit numbers (numbers in which the ones total less than 10)* • Calculate mathematical statements for multiplication *using repeated addition)* using the multiplication (×), and equals (=) signs Solve problems involving multiplication*)*, using materials, arrays, repeated addition, mental methods, and multiplication , including problems in contexts	*Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Understand that division is the inverse of multiplication and vice versa* • *Understand how multiplication statements can be represented using arrays* • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • *Derive and use doubles of all numbers to 100 and corresponding halves* • *Derive and use doubles of all multiples of 50 to 500* • Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • *Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* Solve problems, including missing number problems, involving multiplication *(and interpreting remainders),* including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

End of year expectaions
Multiplication

Year 4	Year 5	Year 6
• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • Recognise and use factor pairs and commutativity in mental calculations • Recall multiplication and division facts for multiplication tables up to 12 × 12 • *Use partitioning to double or halve any number, including decimals to one decimal place* • Use place value, known and derived facts to multiply mentally, including: - multiplying by 0 and 1 - multiplying together three numbers • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • *Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* 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	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • 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 • Recognise and use square (^{2}) and cube (^{3}) numbers, and notation • *Use partitioning to double or halve any number, including decimals to two decimal places* • Multiply numbers mentally drawing upon known facts • Solve problems involving multiplication including using their knowledge of factors and multiples, squares and cubes • 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 • *Use estimation/inverse to check answers to calculations; determine, in the context of a problem, an appropriate degree of accuracy* • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • Identify common factors, common multiples and prime numbers • *Use partitioning to double or halve any number* • Perform mental calculations, including with mixed operations and large numbers • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Multiply one-digit numbers with up to two decimal places by whole numbers • Use estimation *and inverse* to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations Solve problems involving all four operations, *including those with missing numbers*

DIVISION GUIDELINES

Stage One

Prerequisite skills (based on the practical)
Understanding the language of half in different contexts.
Know halves of even numbers up to 10.

Sharing
Requires secure counting skills
-see counting and understanding number strand
Develops importance of one-to-one correspondence
See appendix for additional information on x and ÷ and aspects of number

Sharing – 6 sweets are shared between 2 people. How many do they have each?

Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc.

Grouping
Sorting objects into 2s / 5s/ 10s etc.
How many pairs of socks are there?

There are 10 bulbs. Plant 5 in each pot. How many pots are there?
Jo has 10 Lego wheels. How many bicycles can she make?

Stage Two

÷ = signs and missing numbers

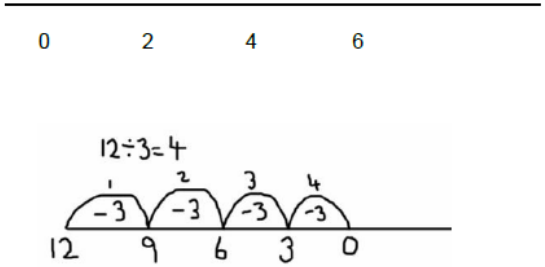
6 ÷ 2 = □	□ = 6 ÷ 2
6 ÷ □ = 3	3 = 6 ÷ □
□ ÷ 2 = 3	3 = □ ÷ 2
□ ÷ ∇ = 3	3 = □ ÷ ∇

Understand division as sharing and grouping

Sharing – 6 sweets are shared between 2 people. How many do they have each?

6 ÷ 2 can be modelled as:

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)



Stage Three (low)

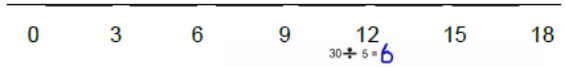
÷ = signs and missing numbers
Continue using a range of equations as in Stage2 but with appropriate numbers.

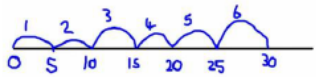
Understand division as sharing and grouping

18 ÷ 3 can be modelled as:

Sharing – 18 shared between 3 (see Level 2 diagram)

Grouping - How many 3's make 18?

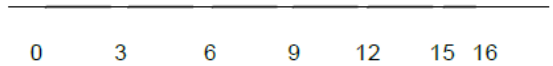




Remainders
16 ÷ 3 = 5 r1

Sharing - 16 shared between 3, how many left over?

Grouping – How many 3's make 16, how many left over?
e.g.



DIVISION GUIDELINES

Stage Three (secure)

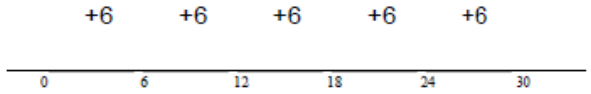
÷ = signs and missing numbers

Recall methods from Stage2

Sharing and grouping

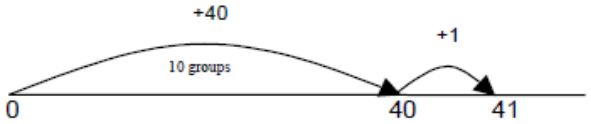
30 ÷ 6 can be modelled as:

grouping – groups of 6 taken away and the number of groups counted e.g:



sharing – sharing among 4, the number given to each person

41÷ 4 = 10 r1



OR 41 = (10 x 4) + 1

Stage Four

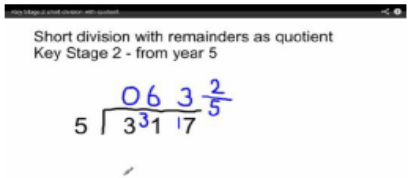
÷ = signs and missing numbers

Recall methods from Stage3

Remainders

Quotients expressed as fractions or decimal fractions:

317 ÷ 5 = 63 2/5 or 63.4

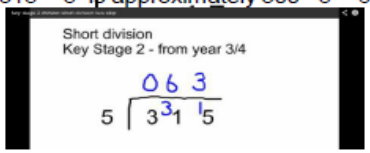


Pencil and paper procedures

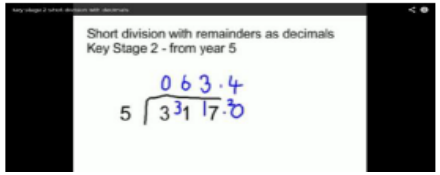
Use 'bus stop' method for division:

Estimate and check.

315 ÷ 5 is approximately 300 ÷5 = 60



Extend to division of decimal numbers by a single digit, up to two decimal places.



Stage Five

÷ = signs and missing numbers

Recall methods from Stage3

Remainders

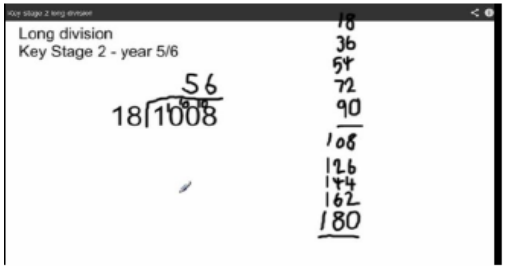
Quotients expressed as fractions or decimal fractions:

676 ÷ 8 = 84.5

Pencil and paper procedures

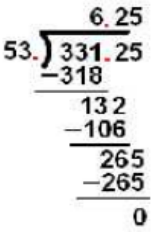
Estimate and check.

1008 ÷ 18 is approximately 1000 ÷ 20 = 50



Use the same method to divide decimal numbers:

Estimate and check:
331.25 ÷ 53 is approximately 300 ÷ 50 = 6



End of year expectations			
EYFS	**Year 1**	**Year2**	**Year3**
They solve problems, including halving and sharing.	• Recall and use doubles of all numbers to 10 and corresponding halves • Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• *Understand division as sharing and grouping and that a division calculation can have a remainder* • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • *Derive and use halves of simple two-digit even numbers (numbers in which the tens are even)* • Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs Solve problems involving division *(including those with remainders)*, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • *Understand that division is the inverse of multiplication and vice versa* • *Understand how division statements can be represented using arrays* • *Understand division as sharing and grouping and use each appropriately* • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • *Derive and use doubles of all numbers to 100 and corresponding halves* • *Derive and use doubles of all multiples of 50 to 500* • Write and calculate mathematical statements for division using the multiplication tables that they know using mental and progressing to formal written methods • *Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* Solve problems, including missing number problems, involving multiplication and division *(and interpreting remainders)*, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

End of year expectations Division		
Year 4	**Year 5**	**Year 6**
• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • Recognise and use factor pairs and commutativity in mental calculations • Recall multiplication and division facts for multiplication tables up to 12 × 12 • *Use partitioning to double or halve any number, including decimals to one decimal place* • Use place value, known and derived facts to divide mentally, including: - - dividing by 1 • *Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context* • *Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy* • Solve problems involving *division (including interpreting remainders),* integer scaling problems and harder correspondence problems such as n objects are connected to m objects	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • 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 • Recognise and use square (^{2}) and cube (^{3}) numbers, and notation • *Use partitioning to double or halve any number, including decimals to two decimal places* • 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 • *Use estimation/inverse to check answers to calculations; determine, in the context of a problem, an appropriate degree of accuracy* • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	• *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)* • Identify common factors, common multiples and prime numbers • *Use partitioning to double or halve any number* • Perform mental calculations, including with mixed operations and large numbers • Divide numbers up to 4 digits by a two-digit whole number using the formal written methods of short or long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Use written division methods in cases where the answer has up to two decimal places • Use estimation *and inverse* to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Use knowledge of the order of operations to carry out calculations Solve problems involving all four operations, *including those with missing numbers*