# Saltergate Schools



#### Calculation policy 2022-2023

Reviewed and Approved by:	Governing Body	
Date Adopted:	November 2022	
Last Reviewed:	(New Document)	
Last Updated:	November 2022	
Date for next Review:	July 2023	
Signed by	Chair of Governors	Headteacher
Name Printed:	Mark Walker	Joanne Hall
Signed:	Mark Walker	Jo Hall
Date:	November 2022	November 2022

At Saltergate Primary Schools we believe that children should be introduced to the processes of calculation through active learning with practical, oral and mental activities. With the building of solid foundations and key knowledge, we expect our children to be able to understand and use appropriate methods to allow them to have mathematical success across their academic learning.

Choosing the appropriate will make sure children will have a deeper understanding and develop strategies to succeed as well as understand the development of their mathematical journey.

We want to ensure children are familiar with written methods alongside mental strategies to ensure ability to answer questions or problems with fluency but also to explain the deeper aspects of what they are doing and as to why.

This document provides a flow of progressive understanding of each of the formal methods to allow the child to have deeper understanding as to what is happening and develops through each year group.

Children should work at the approach they are suited with and only move on once they are ready and have the understanding to do so.

By the end of Year 6, children should be able to choose the most appropriate approach to solve a problem with confidence and fluency in their approach.

This policy contains the key steps to furthering calculation knowledge that is essential for deepening understanding that allows children to have a rich and broad understanding of mathematics.



### Addition

Saltergate Primary Schools		
EYFS		
Vocabulary	add, more, and, make, sum, total, altogether, score, double, one more, two more, ten more, how many more to make?, how many more is than?	
	Method	Example/Representation
Using a range of p contexts for pupil of the concept of	practical resources and real life s develop their understanding addition through counting.	How many bears are there?
		What about if I give you two more? How many are there now?
Children are intro (+) using pictures calculation.	duced to the addition symbol and diagrams to help in the	There are 3 dogs. Another comes in. How many are there altogether?
Take a larger num to count on	ber mentally and use fingers	Count from the larger number. A child will choose the larger number 7 8 2+6= 8
Children show a r form and use obje Children will begi extend their learr	number sentence in picture ects or fingers to help answer. In to explain their reasoning to hing	4 + 2 = 6
Diagrams can be their learning MENTAL STRATE	used to aid the children in GIES: - Develop a mental image (	of the number system Understand the value of
a number - Counting forwards and backwards - Recall of number bonds to 10		

	Year 1		
Vocabulary	number bonds, add, more, plus, make, sum, total, altogether, inverse double, near double, equals, is the same as (including equals sign), score, one more, two more ten more, how many more to make?, how many more is		
	Method	Example/Representation	
Children will be ta beads or number	aught to use a number track, line to support addition		
Children will be ta addition calculation number square	aught how to solve simple ons with the support of a 100	21+7=28	
Children are taug line for addition a own for developn	ht how to use a blank number nd encouraged to make their nent	21+7=28 $21 + 7 = 28$ $20 21 + 7 = 28$	
Children will parti ones when adding within the tens bo	tion numbers into tens and g two 2-digit numbers that lie pundary	10 + 10 = 20 4 + 3 = 7 20 + 7 = 27	
Children will solve using concrete ob representations	e one-step addition problems jects and/or pictorial	I have 5 cars and I am given 3 more. How many cars do I have altogether? 3 = 8 $5 + 3 = 8$	
MENTAL STRATEGIES: - Know addition can be carried out in any order (commutative) - Add 1 and			
2 digit numbers to 20 including 0 - Number bonds to 20 - Doubles of numbers up to and including			
double 10 - Adding 10 to a single digit number - Identify 1 more than a given number			

Year 2		
Vocabulary	add, addition, more, plus, mak	e, sum, total, altogether, score, double, near
	double, one more, two more	ten more one hundred more, how many more
	Method	Example/Representation
Children will use o	concrete objects and pictorial	32+2
representations to	o add: a 2- digit number and	Tens Ones
units, three 1-digi number and mult	t numbers and a 2-digit iples of 10	32= 3 tens & 2 ones +
		2= Lones Tens Ones L L
		34 = 3 tens & 4 ones
Children will parti ones when adding cross the tens bou	tion numbers into tens and g two 2-digit numbers that undary	33+18=51
Children begin to	set out TO + TO (that lie	
within the tens bo	oundary) in columns and	
record as expande	ed column addition	



Children will solve simple worded problems using appropriate visual context to solve questions involving number, quantities and measures

Column addition can be used alongside this

Max has 13 apples and Libby has 14 apples. How many apples are there all together?

$$|3 + |4 = 27$$
  
 $| :: + | :: = | ] ::$ 

**MENTAL STRATEGIES:** - Know that addition is the inverse of subtraction - Add numbers mentally, including: A 2-digit number and units A multiple of 10 to a 2-digit number Two 2-digit numbers Three 1-digit numbers - Use knowledge of inverse to check calculations and solve missing number problems - Use knowledge of number bonds to 10 to calculate numbers bonds to 100 - Count on in tens from any given number (e.g 19 – 29 – 39 – 49 etc)

Year 3		
Vocabulary	add, increase, total, plus, sum, more, altogether, column addition, estimate, inverse, double, near double, one more, ten more one hundred more, how many more to make? how many more is than? how much more is?, tens boundary, bundreds boundary.	
	Method	Example/Representation
Children set out H record as column HTO + TO within t	ITO + O in columns and addition and then progress to the tens boundary	274 + 4 = H T O 274 + 4 = + $274 + 4$ 278
Children set out F record as column boundary Any exchanges to calculation	HO + TO in columns and addition that cross the tens be shown underneath the	$246 + 26 \\ H T 0 \\ + 2 4 6 \\ + 2 6 \\ 2 7 2 \\ + 4 \\ +$
Children set out H record as column hundreds bounda Any exchanges to calculation	HTO + TO in columns and addition that cross the ary be shown underneath the	$436 + 25 \\ H T O \\ 4 3 6 \\ + 2 5 \\ 4 6 1 \\ * $

Children set out HTO + TO in columns and record as column addition that cross the hundred and tens boundaries	278 + 43	
Any exchanges to be shown underneath the calculation	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
Children set out HTO + HTO in columns and record as column addition that cross the tens boundary	329 + 213	
Any exchanges to be shown underneath the calculation	$ \begin{array}{c} H & T & O \\ + & 3 & 2 & 9 \\                                  $	
Children set out HTO + HTO (that cross the tens and hundreds boundaries) in columns and record as column addition	374 + 287	
Any exchanges to be shown underneath the calculation	H T O 3 7 4 + 2 8 7 6 6 1 - *	
Children will solve one and two-step addition problems:		
Can use concrete objects and pictorial representations		
Using formal written method as they develop		
Including missing number problems		
Pupils practise adding fractions with the same denominator	${}^{5}_{7} + {}^{1}_{7} = {}^{6}_{7}$	
Use increasingly complex problems to improve fluency		
MENTAL STRATEGIES: - Add numbers mentally, in	ncluding: A a three-digit number and a single	
digit number <b>&amp;</b> a 3-digit number and multiples of 10 <b>&amp;</b> a 3-digit number and multiples of 100 - Estimate the answer to a calculation and use inverse operations to check answers - Know number		

pairs that total 1000 (multiples of 100) - Calculate 10 or 100 more than any given number

	Yea	ar 4
Vocabulary	add, addition, more, plus, increase, sum, total, altogether, score, double, near double, tens boundary, hundreds boundary, thousands boundary, inverse	
Method		Example/Representation
Children will add using the formal addition	numbers with up to 4-digits written method of column	$\begin{array}{c} 23 \ 26 \ + \ 129 \ 8 \\ \hline Th \ H \ T \ 0 \\ 2 \ 3 \ 2 \ 6 \\ + \ 1 \ 2 \ 9 \ 8 \\ \hline 3 \ 6 \ 2 \ 4 \\ + \ * \end{array}$
Solve two-step pr and explaining re calculations (Bar	roblems using formal jottings asoning behind their method)	Emily has 84 cubes. She builds two towers. One tower uses 18 cubes and one tower uses 55 cubes. How many cubes does he have left over? $ \begin{array}{r}                                     $
Pupils continue p the same denomi	ractise in adding fractions with nator	$\frac{3}{4} + \frac{3}{4} = \frac{6}{4}$
Increase complex Adding fractions	ity beyond one whole	
MENTAL STRATE one thousand - U = 30 and 30 + 1 = to a calculation a	GIES: - Add numbers mentally, in se knowledge of doubles to deri 31) - Know number pairs that to nd use inverse operations to che	ncluding: <b>*</b> a four digit number and multiples of ve related facts (e.g 15 + 16 = 31 because 15 + 15 otal 1000 (multiples of 10) - Estimate the answer eck answers

Year 5		
Vocabulary	Ilary Efficient written method, add, addition, more, plus, increase, sum, total, altogether, score, tens boundary, hundreds boundary, thousands boundary, units boundary, tenths boundary, inverse	
	Method	Example/Representation
Children will add	numbers with more than 4-	
digits using colum	nn addition	
Children will add	decimal numbers with the	
same number of addition	decimal places using column	$3.24 + 1.13$ $0.0^{*},0^{*}$ $3.24$ $+ 1.13$ $4.37$
Add decimal num of decimal places Use 0 as a place h	bers with a different number with column addition holder to hold place value	2.34 + 4.7 0.5 $52.342.34470$
Solve multi-step p methods through reasoning behind calculation Can use other for	problems using formal the policy and explaining their choice of operation and mal methods within	7.04
calculation (eg su	btraction)	
Recognise mixed fractions and con	numbers and improper vert from one to the other	$ \frac{1}{3} = \frac{4}{3}$
Practise adding fr exceed one as a n	actions where calculations nixed number	$\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = \frac{1}{5}$
MENTAL STRATE	GIES: - Add numbers mentally w	ith increasingly large numbers (e.g 10,162 +
2,300 = 12,462) -	Mentally add tenths (e.g 0.2 + 0	.6 = 0.8) and 1-digit whole numbers and tenths
(8 + 0.3 = 8.3) - Use number bonds to 100 knowledge to calculate complements to one using		
hundredths (e.g 0.83 + 0.17 = 1) - Use rounding to check answers to calculations and determine, in		
the context of a problem, levels of accuracy		

	Yea	ar 6
Vocabulary	<b>bulary</b> order of operations, column addition, add, in total, answer, tens boundary, hundreds boundary, thousands boundary, millions boundary, units boundary, tenths boundary, hundredths boundary, decimal place, inverse	
	Method	Example/Representation
Children will add complexity	several numbers of increasing	$ \begin{array}{r} 62301\\ 874\\ +24639\\ +2311\\ \hline 90125\\ xxxx \end{array} $
Children will add with a different n Using 0 as a place	several decimals numbers umber of decimal places holder where appropriate	7.100 23.423 9.160 place holders 39.683
Solve multi-step p methods and exp calculations Can use other for calculation (eg su	problems using formal written laining reasoning behind their mal methods within btraction)	
Add fractions and different denomin equivalent fractio	I mixed numbers with nators using the concept of ons	$ \frac{3}{4} + \frac{7}{8} = \frac{15}{8} \\ \frac{1}{54} + \frac{7}{8} = \frac{13}{8} + \frac{15}{8} \\ + + + + + + + + + + + + + + + + + + +$
MENTAL STRATE 2,300 = 12,462) - check answers to	GIES: - Add numbers mentally w Add decimal numbers mentally calculations and determine, in t	ith increasingly large numbers (e.g 10,162 + (up to 2 decimal places) - Use estimation to he context of a problem, levels of accuracy.



### Subtraction

	EY	<b>FS</b>
<b>Vocabulary</b> take (away), leave, how many are left/left over?, how many have gone?, one less, two less ten less,how many fewer is than?, difference between, is the same as		
	Method	Example/Representation
Using a range of p contexts, using co understanding of	practical resources and real life punting activities to develop subtraction	I had 8 chocolates and I ate 2. How many have I got left?
Children will use of fingers to answer sentences	counting objects, toys or their simple subtraction number	Eg.4-3=1
Children will liste draw a set of obje	n to a subtraction story and acts and cross some off	4-2=2
Children will use t subtraction, e.g. 4 Start with the big they will count ba then count how n	their fingers to help with 4 – 2 = 2. gest number in heads and ack by lowering a finger in turn nany fingers are left	5-4=1 3 2 4 1
Children can use ounderstanding	characters or puppets to help	
<b>MENTAL STRATEGIES:</b> - Develop a mental image of the number system - Children count backwards using familiar number rhymes (e.g '10 Green Bottles', '5 Fat Sausages') - Count backwards from different starting points.		

Year 1		
Vocabulary	subtract, take away, minus, leave, how many fewer isthan?, how much less is? half, halve, how many are left/left over?, how many are gone?, one less, two less, ten less, how many fewer is than?, how much less is? =, equals, sign, is the same as, count on, count back, difference between. how many more isthan?, how much more is?	
	Method	Example/Representation
Children will be ta beads or number by counting backy	aught to use a number track, lines to support subtraction wards	8-2=6
Children will be ta subtraction calcul square	aught how to solve simple ation using a 100 number	28-7=21         1 - 100 Grid         1 2 3 4 5 6 7 8 9 1         11       12       3       4 5 6 7 8 9 1         11       12       13       14       15, 16 17 18 19 2         21       22       23       24 25 26 27 28 29 3       21 3         31       32       33       34 35 36 37 38 39 4       4         41       42       43       44 45 46 47 48 49 5       5         51       52       53       54 55 56 57 58 59 6       6         61       62       63       64 65 66 67 68 69 7       7         71       72       73       74 75 76 77 78 79 8       8         81       82       83       84 85 56 87 88 89 9       9         91       92       93 94 95 96 97 98 99 10       9       9
Use/ children mal subtraction (coun Children will begin the tens boundar cross the tens bou	ke a blank number line for ting backwards) n with TO – O that lie within y then move onto TO – O that undary	14 - 3 = 11 $14 - 6 = 8$ $14 - 6 = 8$
Children will solve problems: Using concrete ob representations Using number line Including missing	e one-step subtraction ojects and pictorial es number	8=5
<b>MENTAL STRATEGIES:</b> - Subtract 1 and 2 digit numbers to 20 including 0 - To know that subtraction is not commutative and that the larger number must always come first - Use knowledge of number bonds to 10 and 20 to reason $(9 + 1 = 10 \text{ so } 10 - 9 = 1 \text{ and } 10 - 1 = 9)$		

Year 2		
Vocabulary	subtract, minus, leave, how m how much fewer is?, differer	any are left/left over?, how many less is than?, nce between, half, halve, equals, sign, is the same
	Method	Evample/Representation
Children are enco	uraged to use a blank number	Example/ Representation
Children are enco line to solve TO – then units by: • Positioning the sentence at the e • Partitioning the units • Counting back in • Counting back in	uraged to use a blank number TO and count back in tens and first number in the number nd of the number line. second number into tens and n tens (or multiples of 10) n ones	19 - 12 = 7
Children will use t to use a blank nur the smallest num tens and ones) to sentences (TO – T	their knowledge of difference mber line to count on from ber to the largest number (in solve subtraction number O)	$\frac{23 - 17 = 6}{13 + 32}$
Children will be e number line and b efficient strategy	ncouraged to draw their own begin to decide on the most	23 - 17 = 6 -3 -3 17 -3 17 -3 23 or +3 +3 17 -3 23 17 -3 23 23 17 -3 23 23 17 -3 23 23 23 17 -3 23 23 17 -3 23 23 17 -3 23 23 17 -3 23 23 23 23 17 -3 23 23 23 17 -3 23 23 23 17 -3 23 23 23 17 -3 23 23 23 17 -3 23 23 23 17 -3 23 23 17 -3 23 23 17 -3 23 23 17 -3 23 23 17 -3 23 17 -3 17
between addition	and subtraction	64 - 36 = 1 36 + 1 = 64 44 + 20 + 4 = 28 4 + 20 + 4 = 28 64 - 36 = 28

Children will solve one and two-step
subtraction problems using appropriate visual
context to solve questions involving number,
quantities and measures
Number lines can be used alongside this

**MENTAL STRATEGIES:** - To know that subtraction is the inverse of addition - Use knowledge of inverse to check calculations and solve missing number problems - Subtract numbers mentally, including: **\*** subtracting units from a 2-digit number **\*** subtracting a multiple of 10 from a 2-digit number **\*** subtracting a 2-digit number from another 2-digit number - Recall and use subtraction facts to 20 fluently - Use knowledge of number bonds to 100 (multiples of 10) to reason (40 + 60 = 100 so 100 - 60 = 40 and 100 - 40 = 60)

Year 3		
Vocabulary	leave, subtract, less, minus, col exchange, how many are left/le more/fewer is than?, how m multiples of tens and hundreds	umn subtraction, inverse, decomposition, ft over?, difference between, how many nuch more/less is?, Is the same as, equals, sign.
	Method	Example/Representation
Children begin to and record as co within the tens b	vietnod o set out TO – TO in columns lumn subtraction that lie boundary	Example/ Kepresentation

Children begin to set out TO - TO in columns	31 -12 = 19
and record as column subtraction with	Exchange for
decomposition that cross the tens boundary	10 ones
In decomposition, number reduced must be	subtract
crossed out with one, neat, line and the new	ones
value written above it	tens
within the tens boundary	$\begin{array}{c} H \\ T \\ 2 \\ 3 \\ 4 \\ 1 \\ 3 \\ - \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 1 \end{array}$

Children begin to set out HTO - TO in columns and record as column subtraction with decomposition that cross the tens boundary <i>In decomposition, number reduced must be</i> <i>crossed out with one, neat, line and the new</i> <i>value written above it</i>	$\begin{array}{c} 1 + 2 - 17 = 125 \\ H & T & 0 \\ 1 & 34 & 2 \\ 1 & 7 \\ 1 & 7 \\ 2 & 0 \\ 1 & 2 & 5 \\ 1 & 2 & 5 \\ 1 & 2 & 5 \end{array}$
Children begin to set out HTO - TO in columns and record as column subtraction with decomposition that cross the hundreds boundary	224 - 72 = 152
In decomposition, number reduced must be crossed out with one, neat, line and the new value written above it	H - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
Children begin to set out HTO - TO in columns and record as column subtraction with decomposition that cross the hundreds and tens boundary	321-64=257
In decomposition, number reduced must be crossed out with one, neat, line and the new value written above it	H 1 0 27 12 6 4 7 0 0 2 5 7 2 5 7

Children begin to set out HTO - HTO in columns and record as column subtraction with 2= 69 24 decomposition that cross the hundreds and tens boundary *In decomposition, number reduced must be* O crossed out with one, neat, line and the new value written above it 2 9 0 6 0 0 O 9 6 Children will solve one and two-step subtraction problems (including missing number problems) Children practise subtracting fractions with the same denominator °/,-1/,=1/, Increase difficulty to improve fluency MENTAL STRATEGIES: - Subtract numbers mentally, including: & Subtracting a single digit number from a 3-digit number & Subtracting a multiple of 10 from a 3-digit number & Subtracting a multiple of 10 from a 3-digit number - Estimate the answer to a calculation and use inverse operations to

check answer

		Year 4
Vocabulary	subtract, subtraction, minus, decrease, leave, how many are left/left over?, difference between, how many more/fewer is than?, how much more/less is?, Is the same as,	
	Method	Example/Representation
Children will sub digits using the fo column subtracti	tract numbers with up to 4- ormal written method of on with decomposition	$4   24 -   3   8 =$ $T_{h} + T = 0$ $344 + 1 + 7 = 0$ $344 + 1 + 7 = 1$ $- 1 + 3 + 1 = 8$ $- 1 + 3 + 1 = 8$ $- 1 + 3 + 1 = 8$ $- 1 + 3 + 1 = 8$ $- 1 + 3 + 1 = 8$ $- 1 + 3 + 1 = 8$
Solve two-step p methods used in	roblems using formal written policy	
Pupils continue p with the same de	practise in subtracting fractions enominator to boost fluency	$\binom{6}{4} - \frac{3}{4} = \frac{3}{4}$
Increasingly com whole	plex problems beyond one	
MENTAL STRATE 4-digit number -	<b>MENTAL STRATEGIES:</b> - Subtract numbers mentally, including: - Subtracting multiples of one thousand from a 4-digit number - Use of number pairs that total 1000 (multiples of 10) to calculate subtraction (e.g 1000 – 300	
= 700) - Estimate	the answer to a calculation and	use inverse operations to check answers

Year 5		
Vocabulary	efficient written method, subt between, inverse, decimals, ur decomposition, exchange.	ract, subtraction, minus, decrease, difference nits and tenths boundary, column subtraction,
	Method	Example/Representation
Children will subt 4-digits using the column subtraction	ract numbers with more than formal written method of on with decomposition	
Children will subt same number of decomposition	ract decimal numbers with the decimal places with	5.62 - 2.91 $0.0^{*}.0^{*}$ 47.62 -2.91 2.71
Solve multi-step p methods from thi reasoning	problems using formal s policy and explain their	
Practise subtracti calculations excee	ng fractions where ed one as a mixed number	$ \begin{array}{c} 1^{2} / 4^{-3$
<b>MENTAL STRATEGIES:</b> - Subtract increasingly large numbers mentally (e.g 12, $654 - 1,341 = 11$ , 213) - Mentally subtract tenths (e.g 0.7 - 0.5 = 0.2) and 1-digit whole numbers and tenths (8 - 0.3 = 7.7) - Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy		

Year 6		
Vocabulary	order of operations, subtract, tenths and hundredths bound exchange.	decrease, difference, inverse, decimals, units , ary, column subtraction, decomposition,
	Method	Example/Representation
Children will subt	ract several numbers of	
increasing comple	exity	7423-2376-162
simplify the calcu	lation	$ \begin{array}{r} 2376 \\ + 162 \\ 2538 \\ 1 \end{array} $
Children will subt	ract decimal numbers with a	
different number decomposition	of decimal places with	7.32 - 2.4
Use 0 as a place h in the calculation	older to help with place value	" - <u>2.40</u> Zero place <u>4.92</u> holder
Children will subt with a different n	ract several decimals numbers umber of decimal places	
Combine number simplify the calcu	s where appropriate to lation	
Use 0 as a place h in the calculation	older to help with place value	
Solve multi-step p calculation metho	problems using formal ods of this policy	
Subtract fractions different denomin equivalent fractio	and mixed numbers with nators using the concept of ns	$\frac{1}{7} = \frac{1}{8}$ $\frac{3}{4} = \frac{1}{8}$ $\frac{3}{4} = \frac{1}{8}$ $\frac{3}{4} = \frac{1}{8}$ $\frac{1}{8} = \frac{1}{8}$ $\frac{1}{7} = \frac{1}{8}$ $\frac{1}{7} = \frac{1}{8}$ $\frac{1}{7} = \frac{1}{8}$
<b>MENTAL STRATEGIES:</b> - Subtract increasingly large numbers mentally (e.g 12, 654 – 1,341 = 11, 212). Subtract desimal numbers mentally (in to 2 desimal places). Use estimation to the sh		
213) - Subtract decimal numbers mentally (up to 2 decimal places) - Use estimation to check		
	actions and actermine, in the tor	next of a problem, levels of accuracy.



## Multiplication

EYFS		
Vocabulary	group, lots of, double	
	Method	Example/Representation
Children will cour of objects and ad	at groups of the same number d them together	Count groups of 2 and then count all objects to add them together.
Grouping taught representations	hrough practical and pictorial	2 4 6
Children will solve doubling	e simple problems involving	
MENTAL STRATE	<b>GIES:</b> - Develop a mental image ing in 2s. 5s and 10s Number	of the number system Understand the value of patterns on a number line and on a hundred
square – 2's, 5's a	ind 10's.	

Year 1		
Vocabulary	odd, even, count in twos, fives how many times? lots of, grou	s, count in tens (forwards from/backwards from), ups of, once, twice, five times, ten times , multiple
	Method	Example/Representation
Children will cour of objects and ad The children learr	nt groups of the same number d them together. n about grouping in relevant	I have 5 pairs of football boots in the bag. How many boots are there?
Bead strings and of support counting 10's	cural support counting sticks will be used to in sequences of 2s, 5s and	
Children will reco and sequences in 10	gnise and complete patterns volving multiples of 2, 5 and	
Answer one-step	word problems	Alfie, Ella and Emily all have a pair of shoes. How many shoes are there all together?
involving counting and doubles.	g in multiples of 2, 5 and 10	
Use concrete obje representations t	ects and pictorial o support	
Children will be ir	ntroduced to an arrays	
Build awareness t addition	o multiplication as repeated	
		3+3+3+3=15
		5+5+5=15
MENTAL STRATEGIES: - Count forwards and backwards in multiples of 2s, 5s and 10s Recall		
doubles of numbers up to and including 10.		

Year 2		
Vocabulary	odd, even, twos, fives, tens, th five times, ten times, multiple addition, array, row, column, c	rees, lots of, groups of, once, twice, three times, of, times, multiply, multiply by, repeated double.
	Method	Example/Representation
Recognise and wr (x) in work	ite the multiplication symbol	
Children will unde multiplication as i Use a blank numb	erstand the operation of repeated addition per line and will use practical	2 × 2 = 52
resources to supp support this)	ort this (use counting sticks to	5 10 15 20 25
Children will be al multiplication cal and number sente	ble to represent a culation using above methods ence	5x3=15
Children will solve problems	e one-step multiplication	I have 3 tigers with 10 stipes each. How many stripes do they have all together?
Use above metho	ds to support this	
Include missing n	umber problems	0 10 20 30
<b>MENTAL STRATEGIES:</b> - Count forwards and backwards in multiples of 3 Know the 2, 5 and 10 times tables (in and out of order) - Recognise odd and even numbers		

Year 3		
Vocabulary	multiply, times, groups of, equal groups of, multiple of, multiplied by, estimate, inverse, grid multiplication, expanded column multiplication, partition,	
	commutative, associative, product.	
	Method	Example/Representation
Children will learr digit numbers wit	n to calculate doubles of 2- h partitioning	Double 32= 32+32=64 30+30=60 2+2=4
Use concrete mat representation	erials alongside written	$60+4=64$ $3^{\circ} + 4^{\circ} + 4^$
Children will be ta x O) through part	aught to multiply numbers (TO itioning for use in grid method	$32 \times 4 = 136$ $\frac{\times   30   2}{4   120   3} + 170 \\ + 128 \\ + 136 \\ 1 36 \\ 1 36 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $
Children will be ta x O) using expand	aught to multiply numbers (TO	$32 \times 4 = 136$ $32 \times 4 = 136$ $4 \times 2)$ $1 = 2 = 0  (4 \times 2)$ $1 = 2 = 0  (4 \times 30)$ $1 = 2 = 8$
Children will solve multiplication, inc	e problems involving cluding scaling	A bear is 2 metres tall, a giraffe is 3 times larger, how large is the giraffe?
4 and 8 times tab	GIES: - Count forwards and back les (in and out of order) - Conne f place value to calculate multin	wards in multiples of 4, 8, 50 & 100 - Know the 3, ect the 2, 4 and 8 times tables through doubling - lication (e.g. $2 \times 2 = 4$ , $2 \times 20 = 40$ , $2 \times 200 = 400$ )

Year 4		
Vocabulary	multiply, multiplied by, produce groups of, multiply, times, mu	ct, short multiplication, partition, commutative, Itiples, inverse
	Method	Example/Representation
Children will be ta x O) by partitionin using two short n Use addition for t (similar to grid ma	aught to multiply numbers (TO ng the 2- digit number and nultiplications the answers to get final answer ethod)	$36 \times 4 = 144$ $\frac{36}{\times 4} + \frac{120}{24} + \frac{120}{144}$
Children will be ta x O) using short n	aught to multiply numbers (TO nultiplication	46 × 6 T 4 0 6 6 6 × 7 6 × 7 7 6
Children will be ta (HTO & O) by par (as above for TOx multiplications Use addition for t (similar to grid mo	aught to multiply numbers titioning the 3- digit number O) to make 3 short the answers to get final answer ethod)	$2 4 3 \times 4$ $\frac{2 00}{100} \frac{40}{100} \frac{3}{12}$ $\frac{40}{100} \frac{\times 4}{12}$ $\frac{40}{100} \frac{\times 4}{12}$ $\frac{800}{160} \frac{12}{12}$ $\frac{800}{160}$
Use short multipl questions of up to	ication method to answer o 3 digit by one digit	$243 \times 4$ $243 \times 4$ x - 4 7 + 2 1 + 1
Solve problems ir policy procedures	volving multiplying using	
<b>MENTAL STRATEGIES:</b> - Know all times tables up to and including 12 x 12 (by the end of Year 4) - Recognise and use factor pairs (e.g factor pairs for numbers up to and including 10) - Know that TU x 5 is TU x 10 then divide by 2 (e.g 18 x 5 = $(18 \times 10) \div 2 = 90$ ) - Know that TU x 9 is TU x 10 then subtract TU (e.g 18 x 9 = $(18 \times 10) - 18 = 162$ )		

Year 5		
Vocabulary	composite numbers, prime nu number, derive, factor pairs, fo by, multiple of, product, short scaling, decimal place, units, to	mber, prime factor, cube number, square ormal written method, times, multiply, multiplied multiplication, partition, long multiplication, enths and hundreds.
	Method	Example/Representation
Children will be ta x TO) by partition and using two sho Use addition to co final answer	aught to multiply numbers (TO ing the second 2- digit number ort multiplications ompile answers to achieve	$34 \times 23$ $34 \times 23$ $34 \times 23$ $4 \times 23$ $54 \times 20$ $4102$ $782$
Children will be ta x TO) using long n	nught to multiply numbers (TO nultiplication	x 34 × 23
Children to excha cross out after us	nge under the number and e to avoid confusion	× 1 × 1 + 6 7 8 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2
Children will be ta (HTO x TO) using l	aught to multiply numbers ong multiplication	$324 \times 32$ $\times \begin{array}{r} 3 & 2 & 4 \\ 3 & 2 & 4 \\ 3 & 2 \\ 6 & 4 & 8 \\ 4 & 9 & 7 & 2 & 0 \\ 1 & 0 & 3 & 6 & 8 \\ 1 & 0 & 3 & 6 & 8 \end{array}$
Children will be ta (ThHTO x O) using	nught to multiply numbers	$3248\times 6$ $3248\times 6$ $\times \frac{3248}{6}$ 1948 1948 248 1948 248 1948 248 248 1948 248 248 248 1948 248 248 248 1948 248 248 248 1948 248 248 248 1948 248 248 1948 248 248 1948 248 1948 248 1948
Children will be ta (ThHTO x TO) usir	aught to multiply numbers	$3246 \times 23$ $3246 \times 23$ $7 + 38$ $4 + 4 + 20$ $7 + 46 + 5 = 8$ $7 + 46 + 5 = 8$



number is and recall the first 5 cube numbers

Year 6		
Vocabulary	common factors, multiples, prime, formal written method, multiply, multiplied by, multiple of, product, short and long multiplication, partition, scaling, decimal place, units, tenths and hundredths.	
	Method	Example/Representation
Multiply numbers three decimal pla	s by 10, 100 and 1000 up to ces as a starting point	$ \begin{array}{c} 2.473 \times 10 \\ 2.473 \times 100 \\ 2.473 \times 1000 \\ 2.473 \times 1000 \\ \hline \\ 1000 \\ \hline \\ 24.73 \\ 24.73 \\ 24.73 \\ 24.73 \\ 24.73 \\ 1000 \\ \hline 1000 \\ \hline \\ 100$
Multiply one-digit places) by whole Using appropriat achieve this	t numbers (up to two decimal numbers e multiplication method to	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
Multiply multi-digit numbers using long multiplication		
Multiply simple pairs of fractions with ability to show the answer in its simplest form		$ \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$
<b>MENTAL STRATEGIES:</b> - Use scaling to solve decimal number problems as whole number problems using the rule: 'the number of decimal digits in the question is the same as the number of decimal digits in the answer' - Identify common factors, common multiples and prime numbers - Use common factors to simplify fractions mentally - Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy		



### Division

EYFS		
Vocabulary	halve, half, share, share equa	ly, groups
	Method	Example/Representation
Share objects am	ongst groups and state how	
many are in each group Verbal explanation		
Explain how to ha	alve and share	
<b>MENTAL STRATEGIES:</b> - Develop a mental image of the number system Understand the value of		

Year 1		
Vershulary halve share share equally groups equal groups of divide divided by left left over		
Method	Example/Representation	
Understand that share means equal and be able to do this practically	Share 9 bears between 3 people equally:	
Explore the relationship of half meaning divide by two and show in contexts	Can you cut the cake in half?	
Complete simple word problems in a practical or pictural context	Can you share 9 apples between 3 baskets?	
Children will recognise and write the division symbol (÷) in mathematical questions and calculations Teacher should use concrete materials to help this learning	10÷2=5	

Year 2		
Vocabulary	groups of, equal groups of, halve, share,	share equally, divide, divided by, divided into, repeated
	Method	Example/Representation
Understand division as grouping using repeated subtraction on a prepared number line		$12 \div 4 = 3$ My 0 to 30 number line 0 2 0 0 0 0 11 12 13 12
Represent a div	vision calculation using an array	How many groups of 3 are in 15?
Ch represent this then in a number sentence		
Carry out repea to solve a divisi	ated subtraction, on a blank number line, ion number sentence	$12 \div 2 = 6$ $\frac{-2}{6} \div \frac{-2}{4} \div \frac{-2}{6} \div \frac{-2}{6} \div \frac{-2}{10} \div \frac{-2}{12}$
Explain and sho grouping Children will al and grouping	ow the difference between sharing and so connect unit fractions to equal sharing	Sharing
		frouping
Children will so concrete objec	lve one-step division problems using ts and pictorial representations	10 ÷ _ = 5
Including missi	ng number problems	
MENTAL STRATEGIES: - To know that division is the inverse of multiplication - Recall division facts for the 2, 5 and		
10 times tables - Recall halves for even numbers up to and including 20		

Year 3		
Vocabulary	divided by, divide, divided into, grouping, divisor, short division, remainder, inverse.	
	Method	Example/Representation
Method         Introduce short division method and will be encouraged to use multiples of the divisor to assist (TO ÷ O)         Use practical or pictorial representation to support		$36 \div 3$ $3\overline{36}$ $4$ $3\overline{36}$ $4$ $3\overline{36}$ $4$ $3\overline{36}$ $4$ $3\overline{36}$ $4$ $3\overline{36}$ $6$ $6$ $6$ $6$ $6$ $6$ $6$ $6$ $6$ $6$
Children will use division number alongside short	e practical resources to support solving sentences with remainders (TO ÷ O) division	
Pupils connect t and that tenths MENTAL STRAT	enths to place value, decimal measures is to divide by 10 <b>EGIES:</b> - Know the division facts from the 3	$\frac{1}{10}$ $\frac{1}{3} 2 \cdot \frac{1}{3} - equal to \frac{3}{10}$ $30 \div 10 = 3$ 3, 4 and 8 times tables - Use knowledge of place value to
calculate division (e.g. 14 ÷ 2 = 7, 140 ÷ 2 = 70, 1400 ÷ 2 = 700)		

Year 4		
Vocabulary	factor, divisor, divided by, divi short division, derive, Quotien	ded into, remainders, divisible by, equivalent, t, inverse, remainder, multiples, exchange. quotient divisor Jdividend
	Method	Example/Representation
Children will use solving division n remainders (HTO	practical resources to support umber sentences with 9 ÷ O)	$243 \div 2$ 2/243
Children will use the short divisior across place valu Cross out the nur number, or write exchanged to the	practical resources to support o method where exchange e columns occurs. (HTO ÷ O) nber if exchange if the whole to the top left the number e new place value	$122 \div 2$ $2 + 2 = 2$ $2 + 2 = 2$
Find the effect of by 10 and 100 Identifying the va as ones, tenths a	f dividing a 1 or 2-digit number alue of the digits in the answer nd hundredths	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0



Year 5		
Vocabulary	divide, divided by, divided into, divisible by, remainder, quotient, inverse, decomposing, factor, decimal place, units, tenths, scaling, short division.	
	Method	Example/Representation
Use short division with remainders In exchanges, cro whole number, or exchanged to the	to solve division number sentences (HTO ÷ O) ss out the number if exchange if the write to the top left the number new place value	$425 \div 5 = 85$ $5 4^{2}2^{5}$
Learn to divide whole numbers and those involving decimals by 10, 100 and 1000 Decimal remains in place and it is the integers that move place values.		$\begin{array}{c} 372 \div 10 \\ 3722 \div 10 \\ 0 \\ 0 \\ 3722 \div 10 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $
Solve worded problems with appropriate method as shown in the policy		
<b>MENTAL STRATEGIES:</b> - Multiply and divide numbers mentally drawing upon known facts - Associate fractions with division		

Year 6		
Vocabulary	divide, divided by, divided into, divisible by, remainder, factor, quotient, inverse, decimal place, units, tenths, hundredths, scaling, formal written methods.	
		5 1 / 5 1 1
Divido numboro u	Method	Example/Representation
number using the	e formal written method of long	$   \begin{array}{c}     1825 \div 15 \\     121r10 \\     151825 \\     -154 \\     -305 \\     -305 \\     -15 \\     -305 \\     -15 \\     -10 \\     10   \end{array} $
Be able to answe	r division questions with decimal	
remainders		$735 \div 6$ 122.5 6[7'3'5.0]
Divide numbers of	lecimal numbers with up to 3 decimal	1.1.6 - 10
places by 10, 100 Decimal remains move place value	and 1000 in place and it is the integers that is.	$\begin{array}{c} 4 \\ + 1 \\ +$
Be able to answer division questions with decimal remainders or whole number remainders		
Divide proper fra	ctions by whole numbers	$\int_{3^{+2}=1/6}^{1/3^{+2}=1/6} \qquad () \neq 2 = () \qquad () \neq 2 = ()$
<b>MENTAL STRATEGIES:</b> - Use estimation to check answers to calculations and determine, in the context of a problem levels of accuracy - Calculate a fraction of an amount		
problem, levels of accuracy - Calculate a fraction of an amount		

problem, levels of accuracy - Calculate a fraction of an amount